

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
20 March 2003 (20.03.2003)

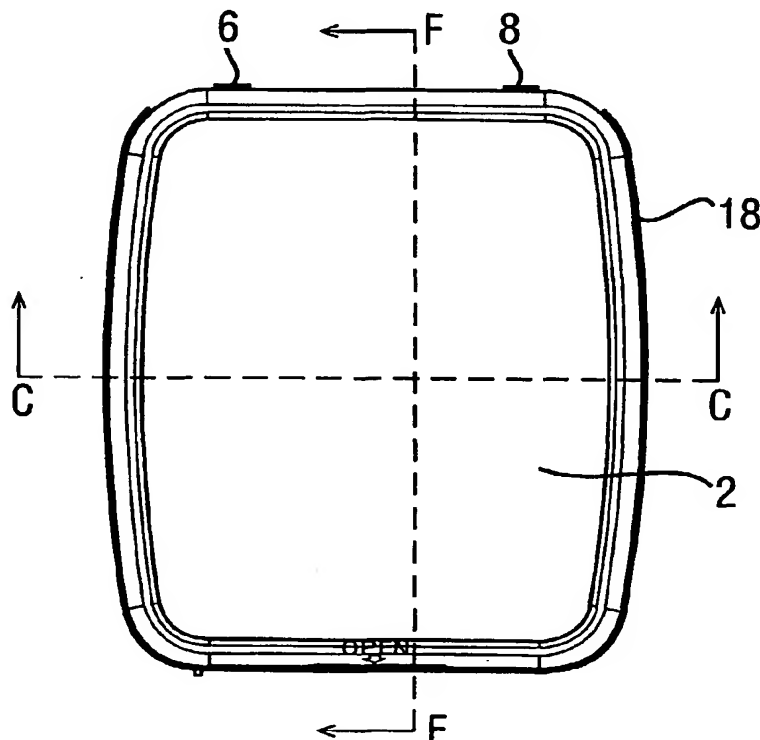
PCT

(10) International Publication Number
WO 03/022703 A2

- (51) International Patent Classification⁷: **B65D 43/16, 55/02**
- (72) Inventor; and
(75) Inventor/Applicant (for US only): **MARSHALL, Neil, R.** [GB/GB]; 26 Vicarage Lane, Stubbington, Hampshire PO14 2LA (GB).
- (21) International Application Number: **PCT/GB02/04156**
- (74) Agents: **COLMER, Stephen, Gary et al.**; Mathys & Squire, 100 Gray's Inn Road, London WC1X 8AL (GB).
- (22) International Filing Date:
12 September 2002 (12.09.2002)
- (25) Filing Language: English
- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW.
- (26) Publication Language: English
- (30) Priority Data:
0122044.1 12 September 2001 (12.09.2001) GB
0205530.9 8 March 2002 (08.03.2002) GB
- (71) Applicant (for all designated States except US): **HUH-TAMAKI (UK) LTD** [GB/GB]; Rowner Road, Gosport, Hampshire PO13 0PR (GB).
- (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),

[Continued on next page]

(54) Title: TAMPER-EVIDENT LID ASSEMBLY



(57) Abstract: A lid assembly comprising a lid portion and a frame portion, one said portion being adapted to receive the other portion to seal a container fitted with the lid assembly wherein the receiving portion has tamper-evident means connected thereto as a frangible bridge while the other portion has a hinged tab and wherein, in the untampered state, the frangible bridge is intact and prevents rotation of the hinged tab while, on breaking the frangible bridge, the hinged tab is able to rotate about its hinge, allowing opening of the lid.



WO 03/022703 A2



Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,
ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK,
TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,
GW, ML, MR, NE, SN, TD, TG).

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Published:

- *without international search report and to be republished upon receipt of that report*

TAMPER-EVIDENT LID ASSEMBLY

The invention relates to lid assemblies for containers. Specifically, the invention relates to lid assemblies having tamper-evident seals.

5

Containers having tamper-evident seals are known for the storage of many substances such as comestibles and chemicals. Tamper-evident means on such containers are required in order to show the purchaser that the substance inside the container has not been exposed to the outside environment and/or contaminated following packaging. Community legislation now enforces the provision of tamper-evident means on many classes of container.

The tamper-evident means can take a wide variety of forms, for example a lid which is connected to a container via a tear strip, such that the lid cannot be removed unless the tear strip is first removed by the user. Once the tear strip is removed, it cannot be re-attached, and the user will thus know that the lid has been opened following initial filling of the container. Other tamper-evident means comprise a lid connected to a collar around the container by a number of frangible bridges. When the lid is first removed by the user (usually by rotating the lid relative to the container), the frangible bridges are broken, and once broken they cannot subsequently be re-formed. Thus, the user can tell prior to purchase whether the lid has been removed from the container following initial filling of the container.

Further tamper-evident means comprise a removable flange extending from and attached to the lid by frangible bridges, and also being connected to a collar around the container via frangible bridges. The collar extends around the rim of the lid, preventing access to the rim in the untampered state. The collar and the lid are not connected to each other apart from by the removable flange. In order to open the container, the frangible bridges connecting the removable flange to both the lid and the collar are broken, and the removable flange is thus detached from the container. the user can then access the rim of the lid and prise the lid from the container. If the container has been tampered with following initial filling, this will be obvious because

- 2 -

the removable flange will be missing.

Following breakage of the tamper-evident means (e.g. the tear-strip or the frangible bridges connecting the collar and lid or the collar, lid and removable flange) the user
5 must then open the container, usually by prising the rim of the lid away from the rim of the container. Removal may be difficult to achieve if the user has reduced dexterity, and such containers can lead to people breaking fingernails when attempting to access the rim of the lid. In order to ameliorate this problem, it has previously been desirable to provide the lid with a rigid flange, extending outwards
10 from the lid. The flange has a larger surface area than the rim of the lid and the user can grip this flange to aid in removal of the lid.

However, there are problems associated with providing such flanges. First, the flanges may have a tendency to break unintentionally. For example, the flanges may
15 break during rough handling, transit or during use in removal of the lid, and subsequent removal of the lid following such breakage may be difficult. Secondly, the flanges can disrupt optimal close-packing of the containers. For example, if the containers are generally cuboid in shape, the provision of a flange on the corner of the lid means that the containers cannot pack in such a close arrangement as if the
20 flange were not present. Thirdly, presence of a flange may make provision of the tamper-evident means more difficult. This is because the flange will result in the lid of the container having an irregular shape, and may therefore mean that more complex tooling is required to provide a tear-strip or collar.

25 It is an object of this invention to provide an improved lid assembly having tamper-evident means, and which provides means for easy removal of the lid following removal or breakage of the tamper-evident means.

According to a first aspect of the invention there is provided a lid assembly
30 comprising a lid portion and a frame portion, one said portion being adapted to receive the other portion to seal a container fitted with the lid assembly wherein the receiving portion has tamper-evident means connected thereto as a frangible bridge

- 3 -

while the other portion has a hinged tab and wherein, in the untampered state, the frangible bridge is intact and prevents rotation of the hinged tab while, on breaking the frangible bridge, the hinged tab is able to rotate about its hinge, allowing opening of the lid; more specifically, there is provided a lid assembly comprising a lid portion
5 having a hinged tab and a frame portion adapted to receive the lid portion to seal a container fitted with the lid assembly, the frame portion having tamper-evident means connected to the frame as a frangible bridge.

In the untampered state, the frangible bridge is intact and prevents outward rotation
10 of the hinged tab. When the container is the subject of tamper, the frangible bridge is broken and the hinged tab is able to rotate about its hinge, allowing opening of the lid. The frangible bridge may be formed between the frame and a detent tab provided as part of the frame, such that the detent tab extends across at least a part of the hinged tab and prevents rotation of the hinged tab.

15 In a preferred embodiment, the lid assembly is provided with retention means which, in the untampered state, engages the hinged tab. The retention means and the hinged tab cooperate to prevent upward movement of the hinged tab and removal of the lid. In order to achieve this, the hinged tab may optionally be provided with
20 projections which engage the retention means and prevent upward movement of the hinged tab.

In a further embodiment of the invention, it is preferred that the frame portion is provided with an upturned skirt along at least part of its periphery, and that the lid
25 portion is provided with a downturned rim. When the lid is closed, the upturned skirt prevents access to at least a portion of the downturned rim so that the lid cannot be opened unless the frangible bridge is broken. By preventing access to the rim of the lid the user is unable to prise the lid open. It is preferred that the downturned rim forms the outer wall of a channel on the lid, the channel being adapted to fit over the
30 frame and hence seal the container. This arrangement has the advantage that, when the lid is closed and the channel is fitted over the frame, horizontal movement of the lid relative to the frame is prevented.

- 4 -

The lid portion and the frame portion may be two separate entities. Alternatively, the lid portion and the frame portion may be connected by at least one hinge, the hinge being made from any suitable material, but preferably being composed of a plastics material.

5

According to a second aspect of the invention there is provided a lid assembly as defined herein which also includes retention means. In the untampered state the tamper-evident means and the retention means engage the hinged tab to prevent rotation of the hinged tab and removal of the lid. In the tampered state, the frangible
10 bridge has been broken and the hinged tab can rotate about its hinge and disengage the retention means, allowing removal of the lid.

The detent tab may be connected to the frame via a hinge, the hinge being located distal to the frangible bridge, preferably at the opposite end of the detent tab to the
15 hinge.

The retention means may be a retention flap which may be connected to the frame by a hinge. A hinged retention flap has the advantage that, once the lid assembly is in place on a container, the container rim contacts the retention flap, pushing it
20 outwards against the hinged tab. By pushing the retention flap and the hinged tab together this in turn pushes the hinged tab against the detent tab. This arrangement prevents any movement of the hinged tab (either rotational or translational) and hence makes it impossible to open the lid without first breaking the frangible bridge.

25 Further suitable features, which can each be used in conjunction with the several aspects of the invention described above, will now be described. The frame may be provided with fastening means for fastening the detent tab to the frame following breaking of the frangible bridge, with the fastening means preferably taking the form of a fastening stud. The stud can frictionally engage a hole which may be provided
30 on the detent tab, hence holding the detent tab in place once the frangible bridge has been broken and the detent tab has rotated away from the hinged tab.

- 5 -

A preferred configuration of both aspects of the lid assembly is where, in the untampered state, the hinged tab is held between and in register with the retention means such as a flap and the detent tab. The hinged tab, retention means and detent tab are thus held in a substantially parallel arrangement.

5

Another desirable feature is where, in the untampered state, the hinged tab is substantially orthogonal to the plane of the lid and substantially parallel to the wall of the container to which the lid assembly is fitted. On breaking the frangible bridge, the detent tab rotates away from a position preventing access to the hinged tab, and
10 the hinged tab can rotate to disengage the retention flap and to lie substantially in the plane of the lid. The hinged tab thus acts as a flange which the user can grip and which aids in the opening of the lid. An advantage of this configuration is that, in the untampered state the hinged tab does not extend outwards from the lid, unlike the rigid flanges described in relation to prior art containers.

15

In a preferred aspect of this invention, the lid assembly of the invention is one wherein the detent tab is connected to the frame by a bridge which is frangible at both ends. In a preferred embodiment the retention means may be connected to the detent tab, preferably as at least one integrally formed retention strut.

20

A preferred lid assembly according to the invention is one wherein, in the untampered state, the hinged tab is held by the retention means such as a retention strut so that the hinged tab is behind, substantially parallel to and in register with, the detent tab. It is particularly preferred that retention means such as a retention strut
25 maintain the detent tab fastened to the hinged tab following breakage of the frangible bridge.

By maintaining the hinged tab in a position where it is substantially parallel to the container walls the containers having the present lid assemblies can be packed
30 closer together than if the tab were simply a rigid tab extending outwards from, and being in the same plane as, the lid.

- 6 -

- Furthermore, by allowing the hinged tab to hinge from being substantially parallel to the container to being substantially planar with the rest of the lid, the tab can be made larger than was previously possible. This is because, in its stored position, the tab size is limited only by the size of the side wall of the container. There is no need
- 5 to make the tab smaller in order to allow closer packing of the containers, as was the case with prior art containers because, in the closed position, the tab does not extend outwards from the plane of the lid. A larger tab is more user-friendly, providing a larger surface area for the user to grip when removing the lid.
- 10 This arrangement also has the advantage that once the lid has been opened and some of the contents removed, the user can then close the lid and rotate the hinge back to its position substantially parallel to the container wall. Again, the container will then occupy less space than prior art containers having a rigid opening flange.
- 15 In a preferred embodiment, the lid portion is provided with retainer means which, when the lid is closed and the hinged tab is in a stored position (i.e. a configuration where the hinged tab is substantially orthogonal to the plane of the lid and substantially parallel to the container wall), retain the hinged tab in this stored position. The retainer means can take the form of one or more projections extending
- 20 from the rim of the lid which releasably engage the hinged tab and retain it in the stored position. Alternatively, the hinged tab itself may be provided with one or more projections which releasably engage the downturned rim of the lid. In both cases, once the tamper-evident means have been broken and the lid opened, the lid can then be shut and the hinged tab retained in the stored position by the retainer
- 25 means. This has the advantage that in the stored position the hinged tab does not extend outwards in the plane of the lid, and the container thus occupies less space.

- The frame portion can be provided with many other features, such as stacking bumps on the inner wall. These stacking bumps make it easier to initially stack a
- 30 plurality of the lid assemblies, and also allow for easy separation of a stack of the lid assemblies by an automated packing line.

- 7 -

If the lid portion and the frame portion are connected, it is preferred that they are moulded as a single unit from plastic. If a plastic material is used to form the lid assembly, it can be any material suitable for moulding (especially injection moulding). Polypropylene is a particularly preferred material.

5

An advantage of a hingeing lid assembly as described above is that, post forming, the lid assembly may be assembled by mechanical means, for example by robotic means, or by an off line handling system. In this way, the lid assembly is assembled into the fully closed, tamper-evident condition and may then be stacked, for example, in a box on a pallet.

The lid assembly can then be transported to the filling factory and can be magazine fed in its fully closed, tamper-evident condition. After the container to which the lid assembly is to be fitted has been filled, the lid assembly can either be placed on the container by hand or by machine, and is then subjected to a downward force which clips the lid assembly onto the container.

During forming of the lid assembly, the hinged tab preferably lies in the same plane as the rest of the lid portion. However, prior to the lid assembly being closed the hinge may be worked in order to improve performance: Working the hinged tab may comprise rotating it, preferably robotically, about its hinge from a position in which it lies substantially in the same plane as the rest of the lid to a position in which it is substantially orthogonal to the plane of the lid. Once the container has been filled and as the lid and frame are brought together in order to form the tamper-evident seal, the hinged tab is preferably substantially orthogonal to the plane of the lid.

The frame can be secured to the rim of the container to be sealed by any suitable means. However, it has been found that the most preferable arrangement is to have the frame secured to the rim of a container in a snap fit manner. To achieve this, the frame portion may be provided with retention lugs which engage the rim of the container to be sealed, and which prevent the lid assembly from being removed from the container without the application of force.

- 8 -

The frame portion may also be provided with retention features which remove any slack between the container and the lid assembly. These retention features preferably take the form of small raised projections extending from the frame portion.

5

In a further embodiment, the frame portion may be an integral part of the container to be sealed. Thus, the rim of the container can be formed having the configuration of the frame portion as described above. The lid is then provided as a separate entity.

10

Once the container has been filled with the substance it is to hold, the lid can then be attached to the container, for example by means of ultrasonic sealing, heat sealing, for example of a peripheral bead, one way studs or adhesives.

- 15 The present lid assembly is suitable for use in conjunction with many different types and sizes of containers, but has been found to be particularly useful for sealing containers for comestibles, such as spreads or ice-cream. The lid assembly can be adapted to seal such containers having a variety of shapes and volumes, but is particularly suited for sealing containers having a generally rectangular opening and
- 20 having a volume of between 1 and 5 litres, preferably approximately 2 litres.

The invention will now be described, by way of example, with reference to the accompanying drawings, in which:

- 25 Figure 1 is a top plan view of the lid assembly of the present invention with the lid closed and the tamper-evident means in their untampered state;
- Figure 2 is a front view of the lid assembly of Figure 1 when in place on a container;
- Figure 3 is a section on line C-C in Figure 1;
- 30 Figure 4 is a detail of Figure 3;
- Figure 5 is a section on line F-F in Figure 1;
- Figure 6 is a side view of the lid assembly and container of Figure 1;

- 9 -

- Figure 7 is a detail of Figure 5;
- Figure 8 is a perspective view of the lid assembly and container shown in Figures 1 to 7;
- Figure 9 is a detail of Figure 8;
- 5 Figure 10 is a section on line C-C of Figure 1 showing an alternative seal design;
- Figure 11 is a detail of Figure 10;
- Figure 12 is a section on line F-F of Figure 1 showing an alternative seal design;
- Figure 13 is a top plan view of the lid assembly of the present invention in place on a container with the lid open and the tamper-evident means in their untampered state;
- 10 Figure 14 is a front view of the lid assembly and container as shown in Figure 13;
- Figure 15 is a section on line F-F in Figure 13;
- Figure 16 is a section on line C-C in Figure 13;
- 15 Figure 17 is a side view of the lid assembly with the lid open and the tamper-evident means in their untampered state;
- Figure 18 is a detail of Figure 16;
- Figure 19 is a perspective view of the lid assembly and container as shown in Figure 13;
- 20 Figure 20 is a detail of Figure 19;
- Figure 21 is a top plan view of a lid assembly of the present invention in place on a container with the lid closed and the tamper-evident means in their tampered state;
- Figure 22 is a front view of the lid assembly and container as shown in Figure 21;
- 25 Figure 23 is a side view of the lid assembly and container as shown in Figure 21;
- Figure 24 is a perspective view of the lid assembly and container as shown in Figure 21;
- Figure 25 is a detail of Figure 24;
- 30 Figure 26 is a perspective view of the lid assembly of the invention, with the lid open and the tamper-evident means in their untampered state;
- Figure 27 is a detail of Figure 26;

- 10 -

- Figure 28 is a section of the lid assembly in place on a container, showing an alternative seal design;
- Figure 29 is a bottom perspective view of the lid assembly shown in Figure 28 showing detail of the alternative seal design;
- 5 Figure 30 is a perspective view of a detail of the lid portion;
- Figure 31 is a perspective view of a second embodiment of the lid assembly of the present invention in place on a container with the lid open and the tamper-evident means in their untampered state;
- 10 Figure 32 is a front perspective view of the second embodiment as shown in Figure 31 but with the lid rotated on its hinges almost to a closed position;
- Figure 33 is a front elevation of the second embodiment as shown in Figure 31 but with the lid closed;
- Figure 34 is a top plan of the second embodiment as shown in Figure 33;
- 15 Figure 35 is a rear elevation of the second embodiment as shown in Figure 33;
- Figure 36 is a vertical section along B-B (Figure 34);
- Figure 37 is detail of the section through the tamper-evident means of Figure 36;
- Figure 38 is a vertical section along F-F (Figure 34);
- Figure 39 is detail of the section through the tamper-evident means of Figure 38;
- 20 Figure 40 is a vertical section along E-E (Figure 34); and
- Figure 41 is detail of the section through the RH closure.

According to one embodiment of the invention as shown in Figures 1 to 30, the generally rectangular lid assembly comprises a lid (2) and a cooperating frame (4).

25 The lid is rotatably connected to the frame by hinges (6,8) along one side.

The frame (4) has an inverted "U" configuration adapted to be a snap-fit onto the rim of a container (12). On the three sides of the frame which do not include hinges (6, 8) the frame is formed with an externally disposed gutter (10) as shown in Figures

30 27 and 28 which, in turn, is provided with peripheral upturned skirt (18). There is no gutter nor upturned skirt along the side of the frame joined to the lid via the hinges.

- 11 -

Centrally located on the inner wall of the gutter (10), on the side opposed to the hinges connecting the lid to the frame, there is provided a retention flap (14) as shown in Figure 20. This retention flap, essentially a part of the gutter has been partially detached by two vertical slots from the rest of the gutter so as to allow it to hinge. When the lid assembly is placed over a container (12) and snapped into place, the rim of the container abuts the inner surface of the retention flap, pushing it outwards.

The inner wall of the gutter is provided with inwardly directed retention lugs (16) as shown in Figures 28 and 29 which clip onto the container rim and prevent the frame from being removed from the container (12). The frame (4) may also be provided with retainer lugs (not shown in the drawings) which are raised bumps in the inner wall of the frame in register with the retention lugs. These lugs are designed to remove slack between the lid assembly and the container, and make the lid assembly more difficult to remove from the container.

On the side of the frame (4) opposite the hinges (6, 8) and in register with the retention lap (14), there is provided a detent tab (20) as part of the skirt (18). The detent tab is connected to the rest of the skirt by a hinge (22) (best shown on Figure 25) at one end and by a frangible bridge (24) at the other. There is also provided a fastening stud (32) on the exterior side of the skirt registable with a port in the detent tab (2).

The lid (2) is generally planar, but has, as is best seen in Figure 13, around its edge a channel (26) (see Figures 13 and 19) having a configuration which fits over the frame (4) when the lid is closed. The downturned rim of the lid, which forms the outer wall of the channel, seals between the gutter (10) and the upturned skirt (18) of the frame.

The lid (2) is provided with a hinged tab (28) as shown in Figure 25, located opposite the hinges (6, 8) and in register with the retention flap (14) and the detent tab (20). The hinged tab is essentially a part of the outer wall of the channel (26) of the lid

- 12 -

which has been partially detached by two vertical slots from the rest of the outer wall.

5 The hinged tab can hinge from being in substantially the same plane as the lid (as shown in Figures 13, 15 and 17), to being substantially parallel to the sides of the container and substantially orthogonal to the plane of the lid (as shown in Figures 21 to 25). The hinged tab is provided with projections (30) (best shown in Figures 15 and 17) on the inner surface (i.e. the surface closes to the container wall) which can engage the retention flap when the lid assembly is in its untampered state.

10

The hinged tab is also provided with other projections (40) (as shown in Figure 30) at either end of the hinged tab. These projections can clip behind the adjacent portions of the downturned rim of the lid, and this enables the hinged tab to be retained in the stored position (i.e. orthogonal to the plane of the lid) once the
15 tamper-evident means have been broken.

In the untampered state, when the lid is closed (see Figures 1 to 12), the user cannot access the edge (i.e. the outer wall of the channel (26)) of the lid (2) because this is covered by the upturned skirt (18) of the frame (4), and hence the user cannot
20 prise the lid open. The only way the lid can be opened is by breaking the tamper-evident means which is now described.

In the untampered state the hinged tab (28) lies substantially parallel to the container walls, substantially orthogonal to the plane of the lid. When the lid
25 assembly is in place on a container (12), the retention flap (14) is pushed outwards by the container and contacts the hinged tab. The projections (30) on the hinged tab engage the retention flap and prevent upward movement of the hinged tab. The detent tab (20) lies across the hinged tab, being held in this position by the frangible bridge (24) connecting it to the frame, and prevents rotation of the hinged tab.

30

Thus, in the untampered state, the hinged tab is held between the retention flap and the detent tab and movement of the hinged tab (either rotational or translational) is

- 13 -

prevented. However, once the frangible bridge (24) has been broken, the detent tab (20) can hinge away from the hinged tab (28), thus allowing access to the hinged tab.

- 5 As shown in Figure 25, the detent tab, which is not completely removed from the lid assembly, can then be held stationary by frictionally engaging the fastening stud (32) on the frame. The projections (30) on the inner surface of the hinged tab still engage the retention flap, and prevent upwards translational movement of the hinged tab. However, the hinged tab can now rotate outwardly about its hinge, towards the plane
10 of the lid (2), and can therefore be disengaged from the retention flap. Once disengaged from the retention flap, the hinged tab can move upwards, allowing the entire lid to rotate about its hinges (6, 8) and hence open the container. The frangible bridge cannot be re-formed. Thus, if the lid has been opened and the contents tampered with, the user will be able to tell because the frangible bridge will
15 be broken.

Further features of an embodiment of the invention can be seen with particular reference to Figures 26 to 29. Figure 26 shows a perspective view of the lid assembly before it is fitted to the container. Stacking bumps (34) are provided on the
20 inside wall of the gutter (10) of the frame (4), and these are shown in more detail on Figure 27. The channel (26) of the lid (2) is provided with ribs (36) which extend across the channel and strengthen the lid.

Figures 28 and 29 show an alternative seal design which may be used instead of the
25 seal design shown in Figure 11. The thin seal (38) does in effect the same job as the retainer lugs described above. This feature also enhances the seal integrity between the frame and the container.

According to a further, preferred embodiment of the invention as shown in Figures
30 31 to 41 inclusive, the generally rectangular lid assembly comprises a lid (2') and a cooperating frame (4'), the lid being rotatably connected to the frame by hinges (6', 8'), suitably bistable hinges, disposed along one side. The lid assembly is fabricated,

- 14 -

in a manner known *per se*, by injection moulding a polyolefin, such as propylene or a styrenic polymer, such as HIPS or ABS.

The frame (4') has an inverted "U" configuration adapted to be a snap-fit onto the rim of a container (12'). On the three sides of the frame which do not include hinges (6', 8') the frame is formed with an externally disposed gutter (10') shown in Figure 41 which, in turn, is provided with a peripheral, upturned skirt (18'). There is no gutter nor upturned skirt along the side of the frame joined to the lid via the hinges. The outer wall of the frame is provided with a plurality of spaced apart, inwardly directed retention lugs (16') shown in Figure 41 which clip onto the container rim and prevent the frame from being removed from the container (12') while the ridge of the frame is provided with retention tines (17') which are disposed about the frame in register with hemispherical pips (19') on the rim of the container. The lugs, tines and pips are designed to remove slack between the lid assembly and the container thereby making the fit very firm and the lid assembly more difficult to remove from the container. On the side of the frame (4') opposed to the hinges connecting the lid to the frame there is provided a detent tab (20') as part of the skirt (18'). The detent tab is further described below.

The lid (2') is generally planar but has around its edge a channel (26') having a configuration which fits over the frame (4') when the lid is closed. The downturned rim of the lid which forms the outer wall of the channel seals, in service, between the outer wall of the frame and the gutter (10'). The lid is provided with a hinged tab (28') located opposite the hinges (6', 8') and in register with the detent tab (20'). The hinged tab is further described below.

The detent tab (20') will now be described. In a centrally located, symmetrical region of the skirt (18') on the side opposed to the hinges (6', 8') the moulding is progressively thickened from either end (11', 13') to form an outer detent tab (20') and an inner retention bar (21') generally parallel to, and generally coextensive with, the length of the detent tab. Between them they define a slot (22'), seen in Figure 37, generally in the plane of the skirt which slot is segregated by two, symmetrically

- 15 -

disposed retention struts (23', 24'), best seen in Figure 39, which extend transversely across the slot from the detent tab to the retention bar. The front of the detent tab, imprinted with instructing indicia (25') such as PULL HERE, is generally flush with the outer surface of the skirt and is connected to the rest of the skirt by two, frangible, symmetrically disposed, substantially vertical lines of weakness (27', 29') in the moulding, the lower portions of which define symmetrically disposed, laterally extending lugs (30', 31').

The hinged tab (28') is located on the lid (2') in register with the detent tab (20'), proud of the outer wall of the channel (26'), and is formed with two downwardly directed tines (32', 33') located so that they may, in service, be urged into the slot (22'), each tine to lock about one of the retention struts (23', 24'). The upper portion of each end of the hinged tab has a return wall (34', 35') each of which bears symmetrically disposed, laterally extending stops (36', 37') which lock on the inner surface of the adjacent outer wall of the channel (26').

In use, a unitary lid assembly is fabricated as described above. The lid is then mated with the frame so that the hinged tab (28') is urged into, and secured in, the slot (22') primarily by the tines (32', 33') locking about the retention struts (23', 24'), thereby restricting vertical translational movement between the lid and the frame. The hinged tab is also restrained from rotational movement by the retention bar (21'), the detent tab (20'), and also the stops (36', 37'). The lid assemblies are next stacked and delivered to a filling line (not shown) in which containers are filled (for example, with fluent comestibles such as yellow fats) and the lids push-fitted onto the filled containers.

On purchase, it will readily be apparent and reassuring to the consumer, on brief inspection of the closed, filled container, that its contents have not been tampered. This is so because the detent tab (20') and the upturned skirt (18') are present as a unitary barrier preventing access to the edge (that is, the outer wall of the channel (26')) of the lid (2') which, in consequence, cannot be prised open. Only by following the instructing indicia (25') on the detent tab (20') can the lid be opened. Thus, when

- 16 -

the consumer pulls forward at the base of the detent tab (20') both of the frangible lines of weakness (27', 29') are broken permitting the detent tab to detach from the skirt (18'). As the detent tab and the retention bar (21') with which it is integral (by reason of the retention struts (23', 24')) are now maintained captive with the hinged
5 tab (28') (by reason of the tines (32', 33') locked about the retention struts), the unitary hinged tab assembly so formed can hinge open allowing the lid to be opened and the contents of the container to be sampled (if necessary, after removing any foil or film). After sampling, the lid is closed and the unitary hinged tab assembly is push-fitted into place with the lugs (30', 31') and the stops (36', 37') restricting
10 vertical and horizontal movement, respectively, of the hinged tab assembly.

This embodiment thus also provides a robust latch and an effective closure for the container and one wherein the lid is not lost or inadvertently fouled.

CLAIMS

1. A lid assembly comprising a lid portion and a frame portion, one said portion being adapted to receive the other portion to seal a container fitted with the lid assembly wherein the receiving portion has tamper-evident means connected thereto as a frangible bridge while the other portion has a hinged tab and wherein, in the untampered state, the frangible bridge is intact and prevents rotation of the hinged tab while, on breaking the frangible bridge, the hinged tab is able to rotate about its hinge, allowing opening of the lid.
2. A lid assembly according to Claim 1 comprising a lid portion having a hinged tab and a frame portion adapted to receive said lid portion to seal a container fitted with said lid assembly; said frame portion having tamper-evident means connected to the frame as a frangible bridge wherein, in the untampered state, the frangible bridge is intact and prevents rotation of the hinged tab, and wherein, on breaking the frangible bridge, the hinged tab is able to rotate about its hinge, allowing opening of the lid.
3. A lid assembly according to any preceding claim wherein the frangible bridge is formed between the frame and a detent tab, the detent tab extending across at least a part of the hinged tab and preventing rotation of the hinged tab.
4. A lid assembly according to any preceding claim wherein the frame is provided with retention means which, in the untampered state, engage the hinged tab, the retention means and the hinged tab cooperating to prevent upward movement of the hinged tab and removal of the lid.
5. A lid assembly according to Claim 4 wherein the hinged tab is provided with projections which engage the retention means and prevent upward

- 18 -

movement of the hinged tab.

6. A lid assembly according to any preceding claim wherein the frame portion is provided with an upturned skirt along at least part of its periphery, and the lid portion is provided with a downturned rim, the upturned skirt preventing access to at least a portion of the downturned rim so that the lid cannot be opened unless the frangible bridge is broken.
7. A lid assembly according to any preceding claim wherein the lid portion and the frame portion are connected via at least one hinge.
8. A lid assembly according to Claim 7 wherein the at least one hinge is provided by a strip of plastics material.
9. A lid assembly having a tamper-evident seal according to any preceding claim, which also includes retention means; wherein, in the untampered state, the tamper-evident means and the retention means engage the hinged tab to prevent rotation of the hinged tab and removal of the lid, and wherein, in the tampered state, the frangible bridge has been broken and the hinged tab can rotate about its hinge and disengage the retention means, allowing opening of the lid.
10. A lid assembly according to any preceding claim wherein the detent tab is connected to the frame by a hinge distal to the frangible bridge.
11. A lid assembly according to any preceding claim wherein the retention means is connected to the frame by a hinge.
12. A lid assembly according to any preceding claim wherein the frame is provided with fastening means for fastening the detent tab to the frame following breaking of the frangible bridge.

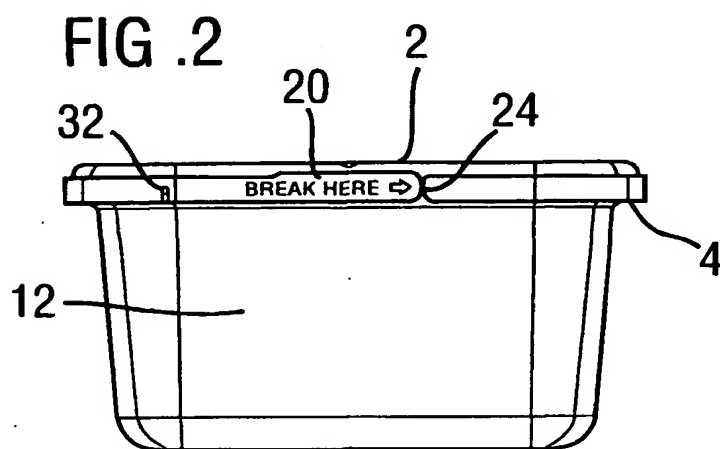
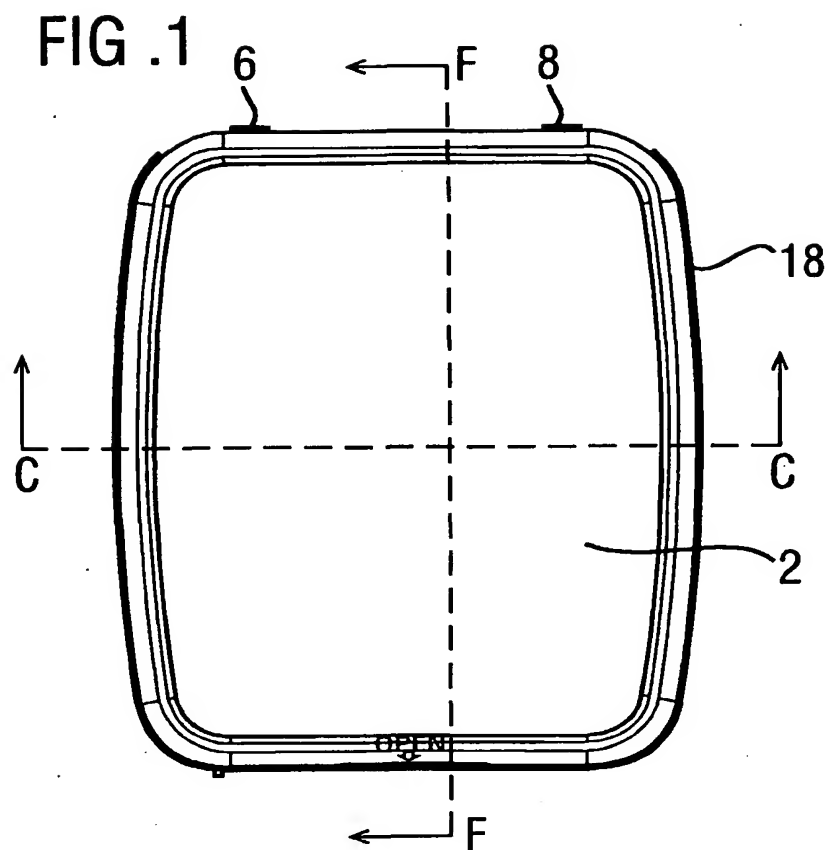
- 19 -

13. A lid assembly according to any preceding claim wherein, in the untampered state, the hinged tab is held between and in register with the retention means and the detent tab, the hinged tab, retention means and detent tab being substantially parallel to each other.
- 5
14. A lid assembly according to any preceding claim wherein, in the untampered state, the hinged tab is substantially orthogonal to the plane of the lid and substantially parallel to the wall of the container to which the lid assembly is fitted, and wherein, on breaking the frangible bridge, the
- 10 hinged tab can rotate to lie substantially in the plane of the lid.
15. A lid assembly according to any of Claims 1 to 8 wherein the detent tab is connected to the frame by a bridge which is frangible at both ends.
- 15 16. A lid assembly according to Claim 15 wherein the retention means is connected to the detent tab.
17. A lid assembly according to Claim 15 or Claim 16 wherein, in the untampered state, the hinged tab is held by the retention means behind,
- 20 substantially parallel to and in register with, the detent tab.
18. A lid assembly according to Claim 15, 16 or 17 wherein the retention means maintain the detent tab fastened to the hinged tab following breakage of the frangible bridge.
- 25
19. A lid assembly according to any preceding claim which is injection moulded from a plastics material.
20. A lid assembly according to any preceding claim wherein the frame portion
- 30 can be secured to the rim of a container in a snap fit manner.

- 20 -

21. A lid assembly according to any preceding claim wherein the lid is provided with retainer means for releasably engaging the hinged tab and retaining the hinged tab in a configuration substantially orthogonal to the plane of the lid.
- 5 22. A container provided with the lid assembly of any of Claims 1 to 21.
23. A lid assembly according to any preceding claim wherein the frame portion is an integral part of the container to be sealed.
- 10 24. A lid assembly as hereinbefore described with reference to any of the accompanying Figures.
- 15 25. Use of a container comprising a lid assembly which includes a lid portion and a frame portion, the lid portion and the frame portion being connected by at least one hinge, for containing yellow or edible fats such as margarine or spreadable butter.
- 20 26. Use of a container according to Claim 25 wherein the container is defined in Claim 22.
- 25 27. A container comprising a receptable with a rim, the rim including a plurality of spaced apart interference means and a lid assembly comprising a lid portion and a frame portion, the frame portion cooperating with the rim and including a plurality of spaced apart interference means which are in register with those on the rim and which cooperate therewith to reduce slack between the frame and the receptable.
- 30 28. A container according to Claim 27 provided with the lid assembly of any of Claims 1 to 21.

1/27



2/27

FIG. 3

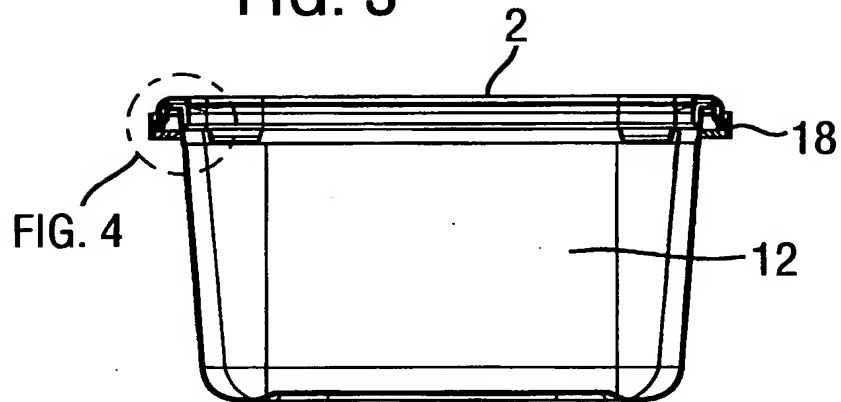
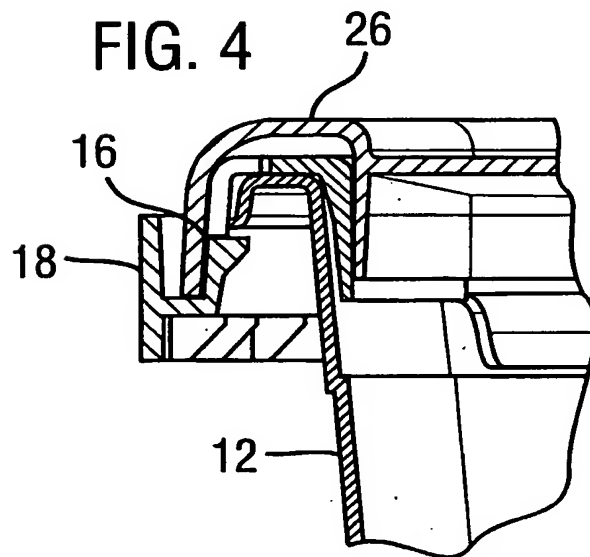


FIG. 4



3/27

FIG. 5

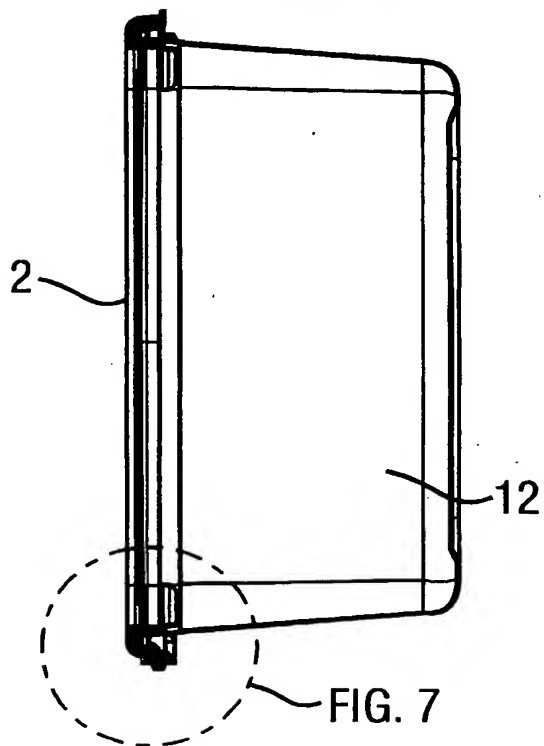
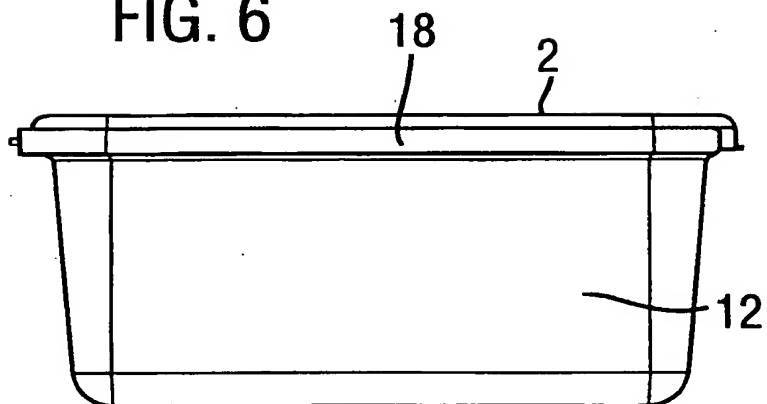


FIG. 6



4/27

FIG. 7

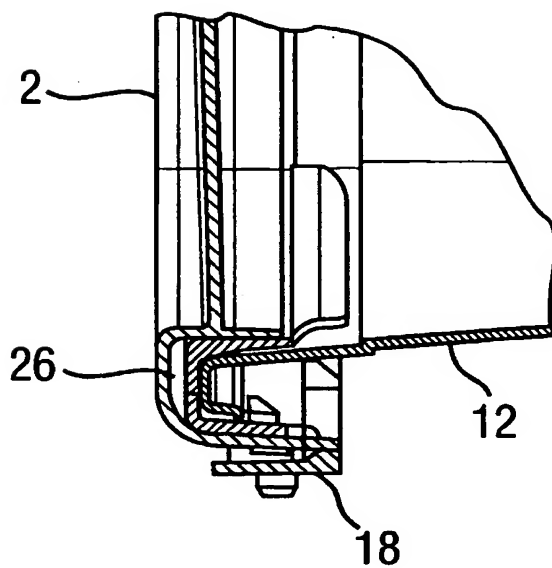
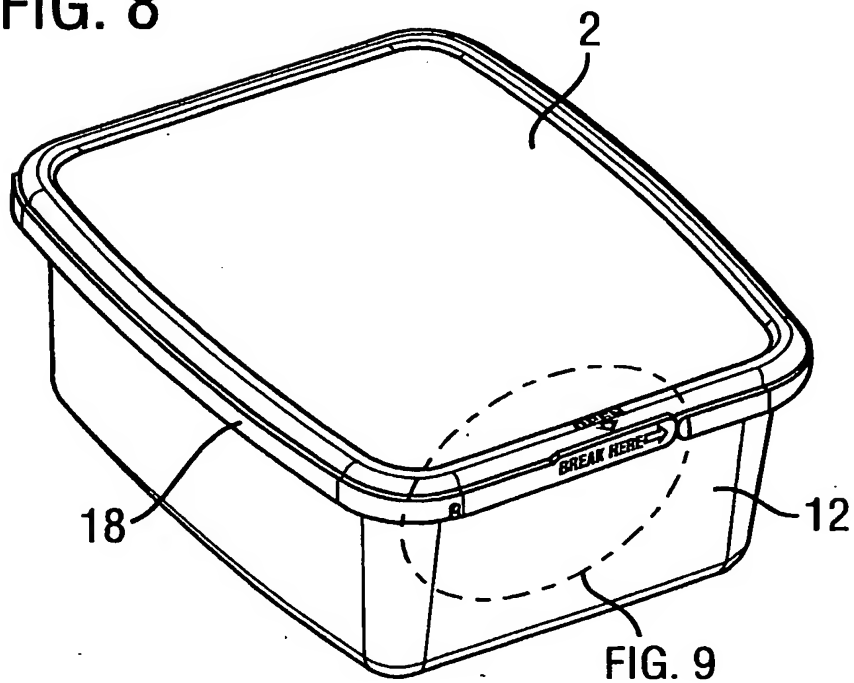


FIG. 8



5/27

FIG. 9

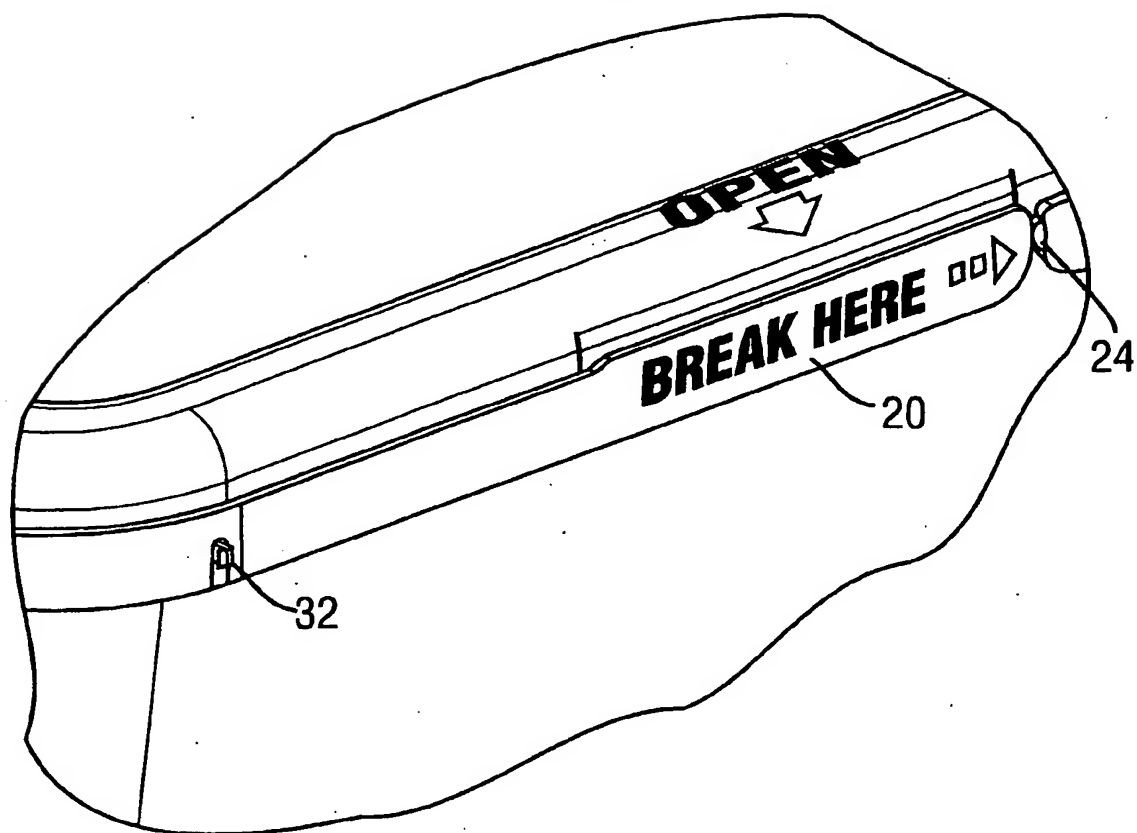
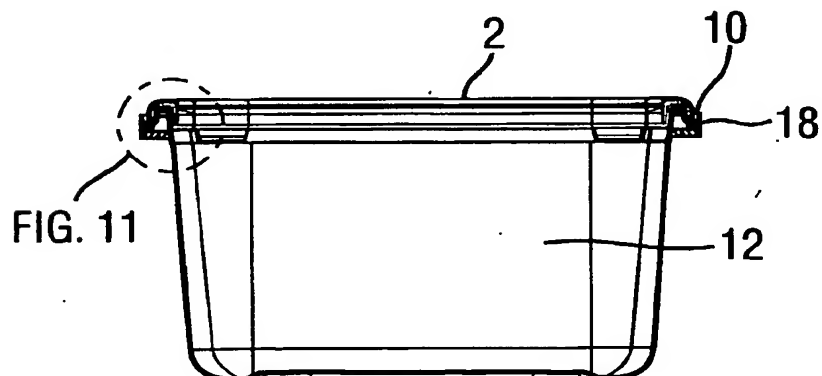


FIG. 10



6/27

FIG. 11

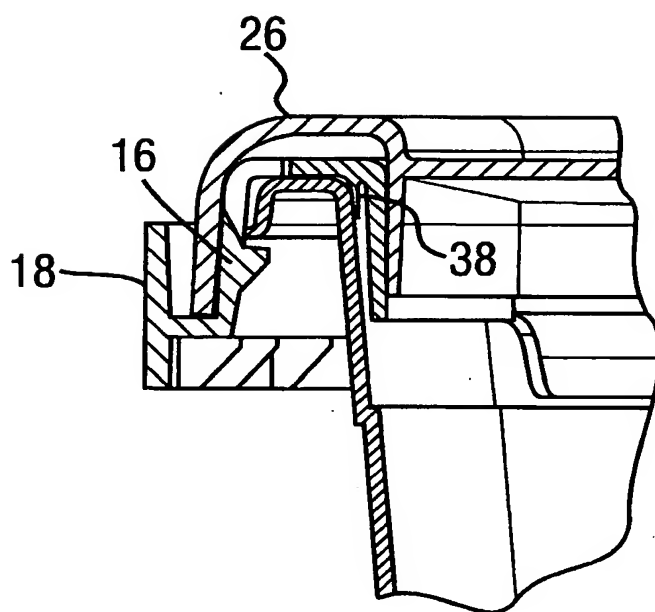
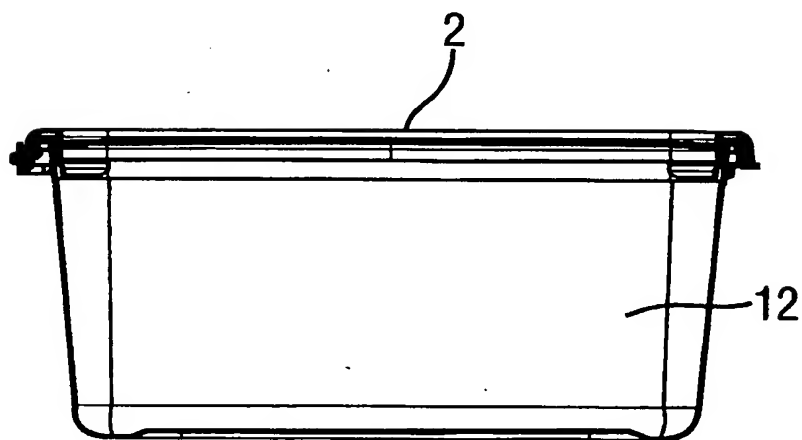
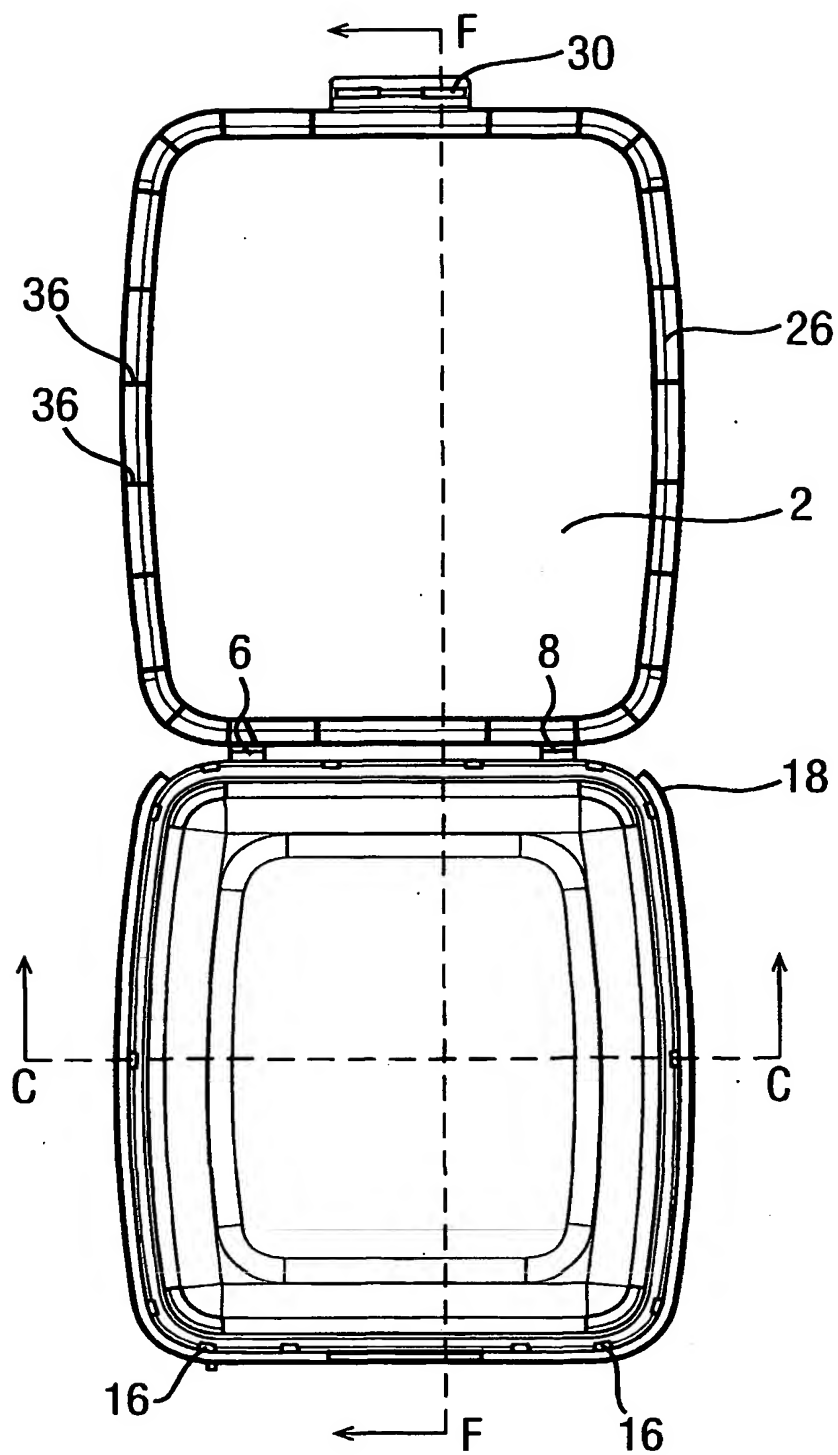


FIG. 12



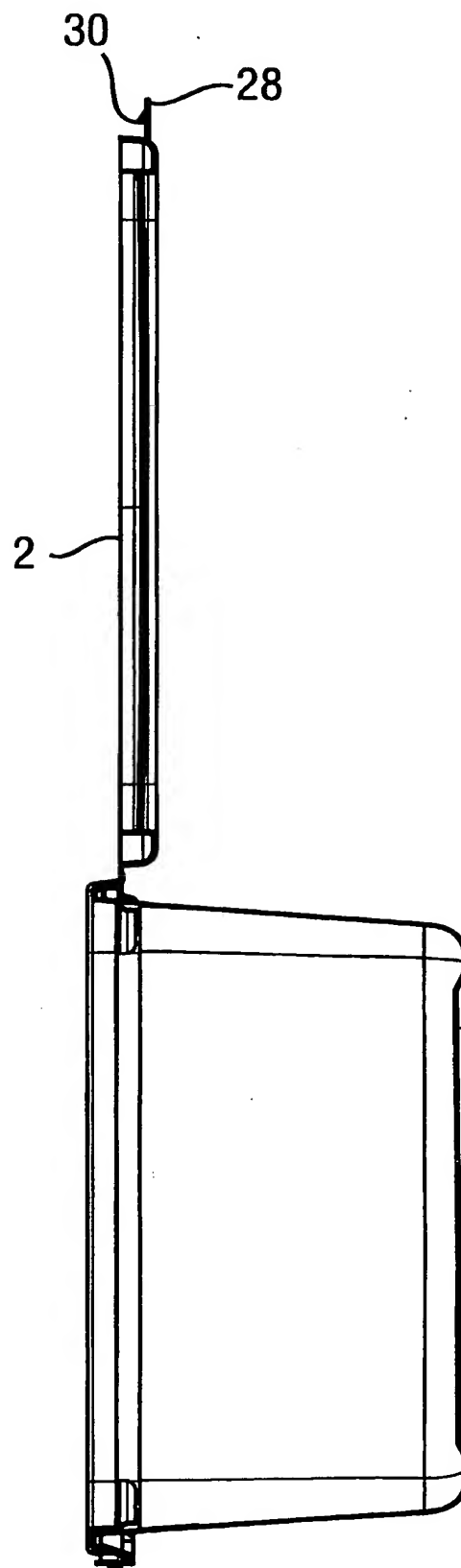
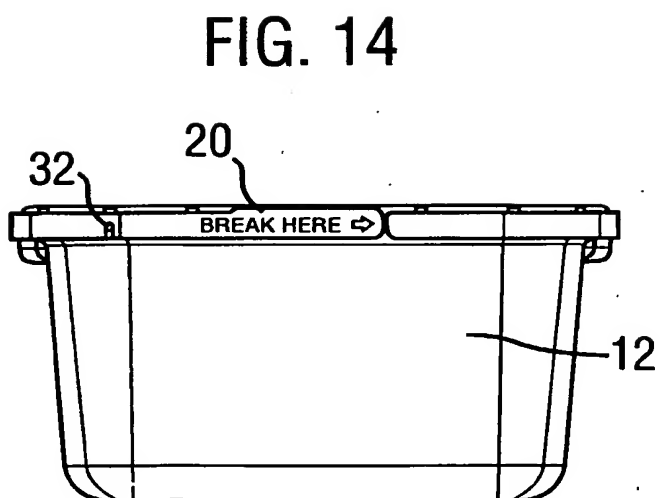
7/27

FIG.13



8/27

FIG. 15



9/27
FIG. 16

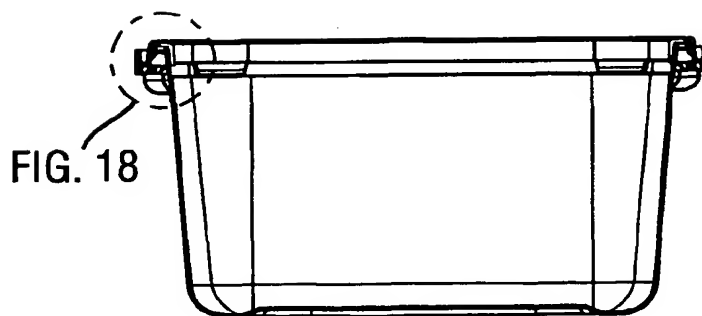


FIG. 17

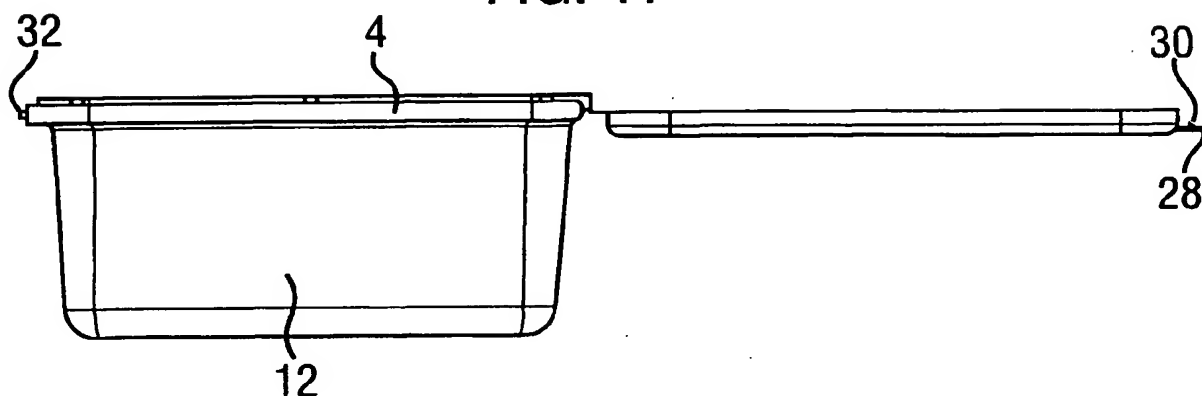
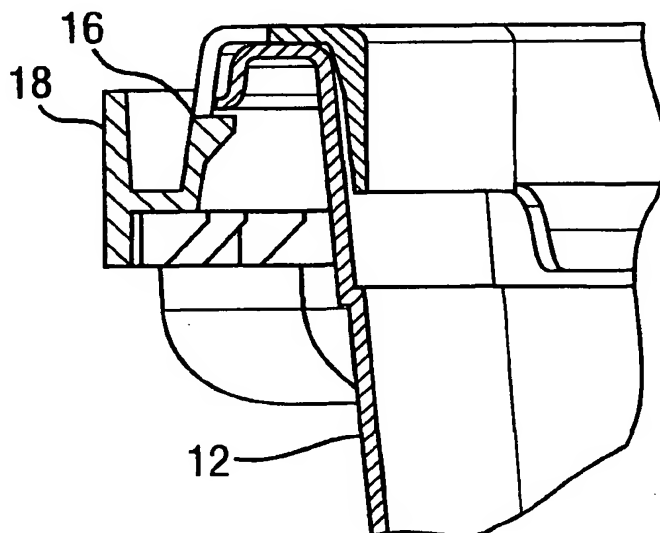


FIG. 18



10/27

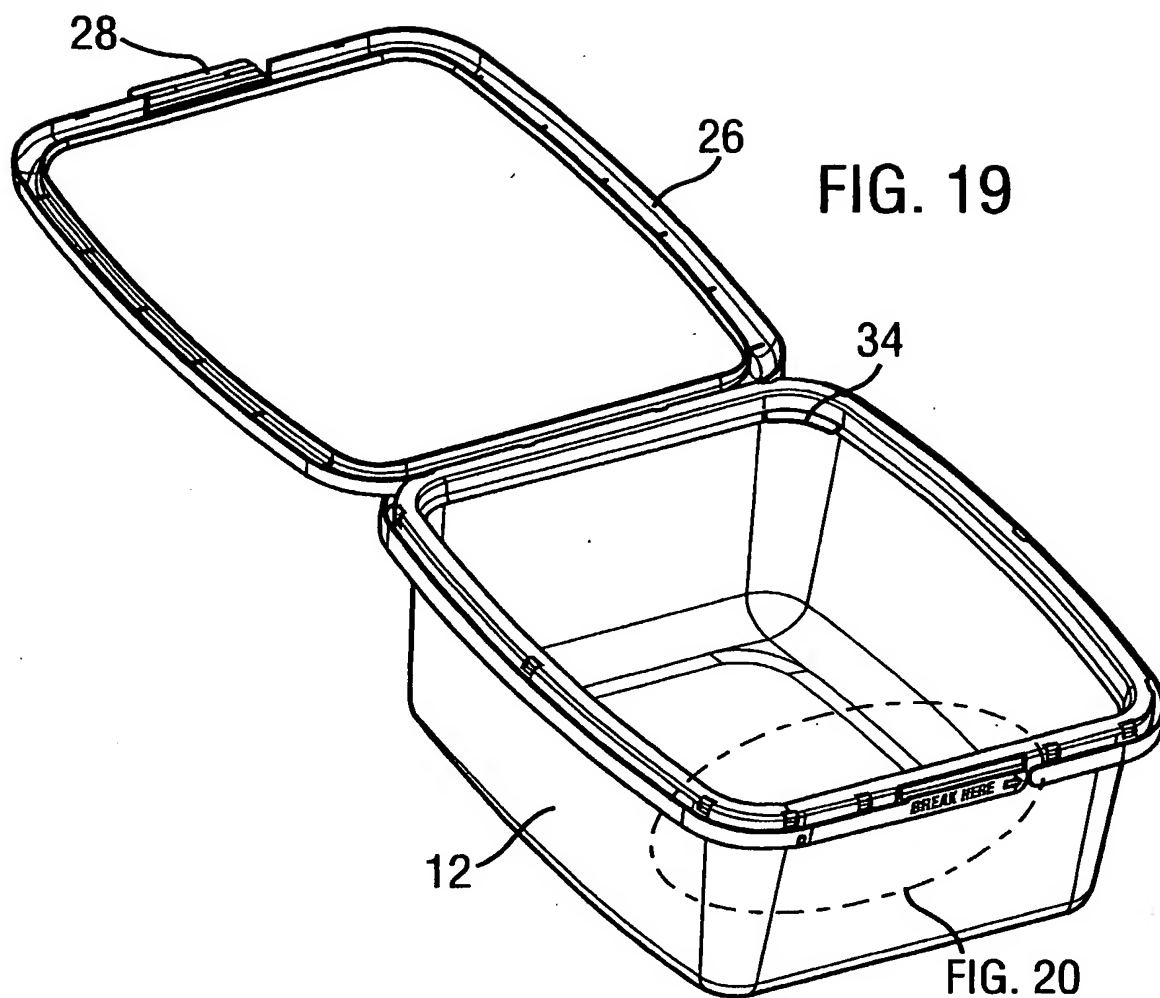


FIG. 20

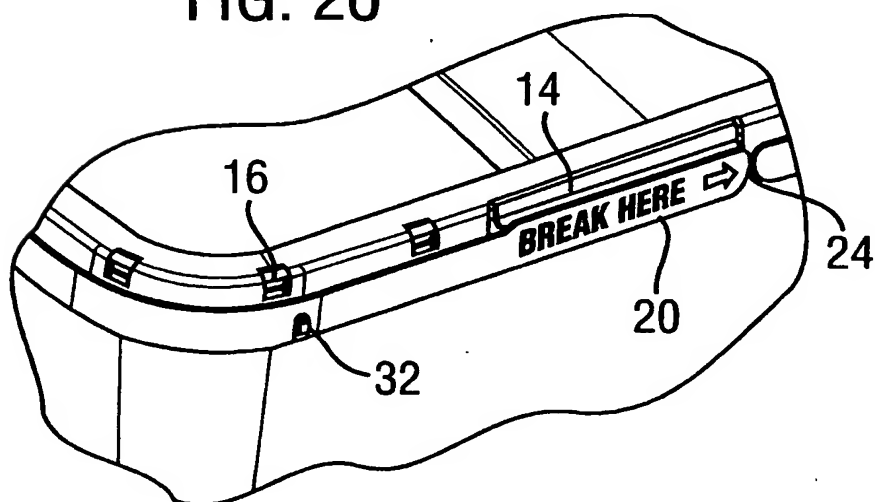


FIG. 21

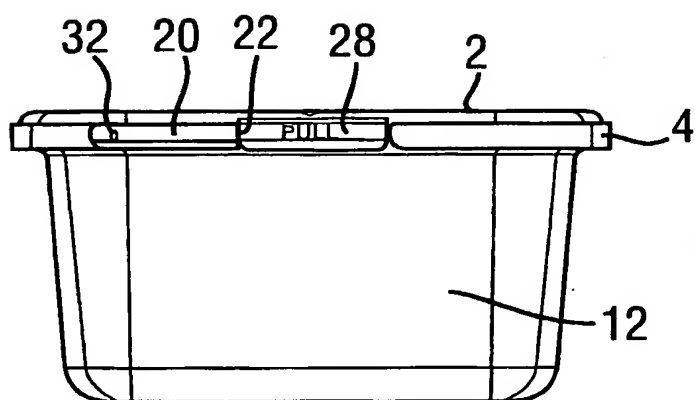
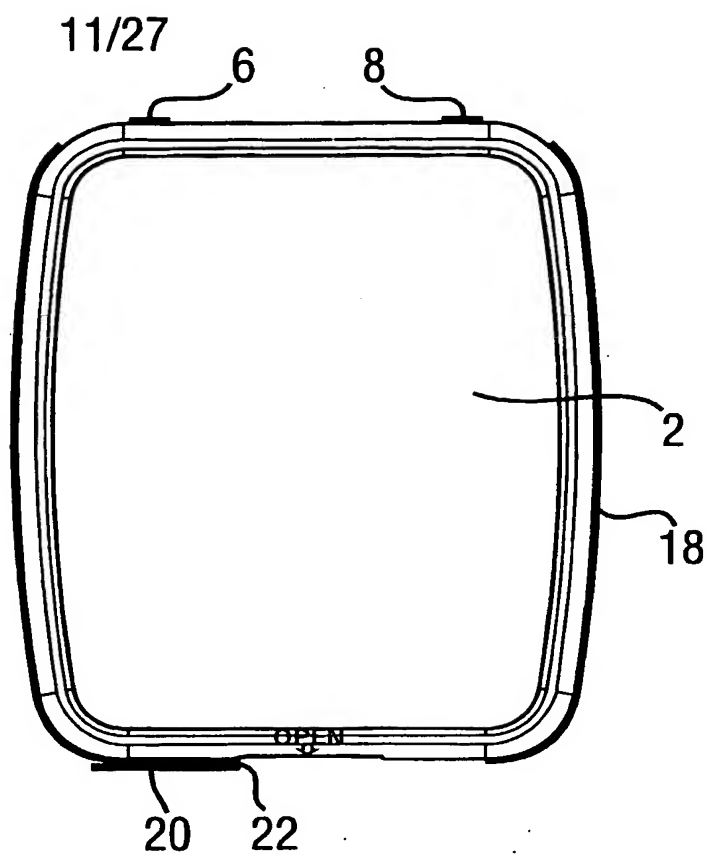
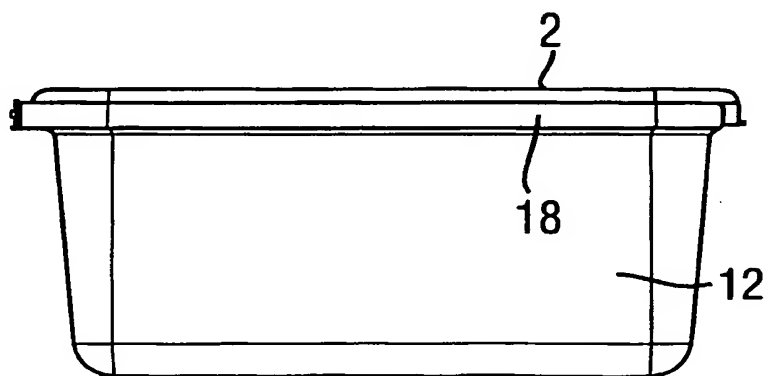


FIG. 22

FIG. 23



12/27

FIG. 24

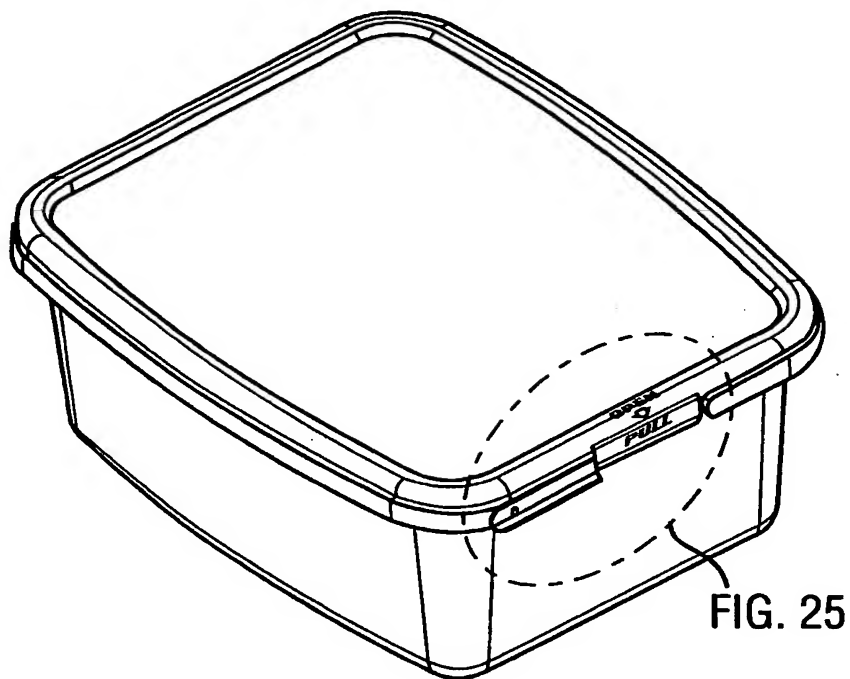
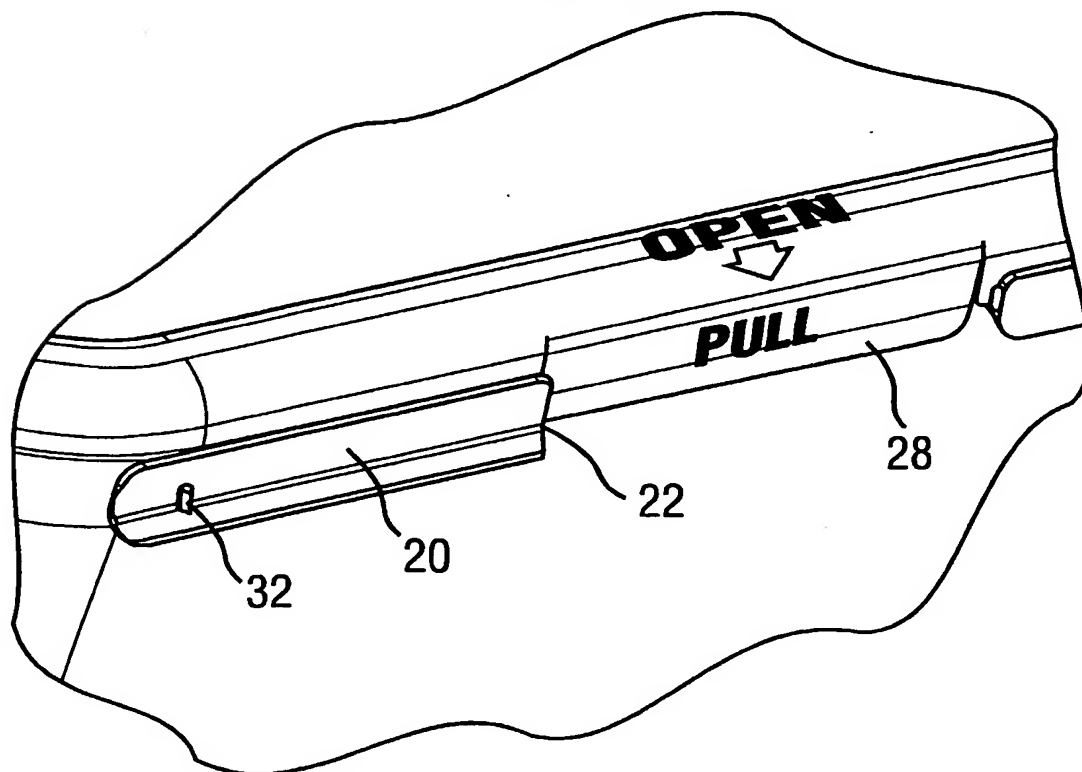
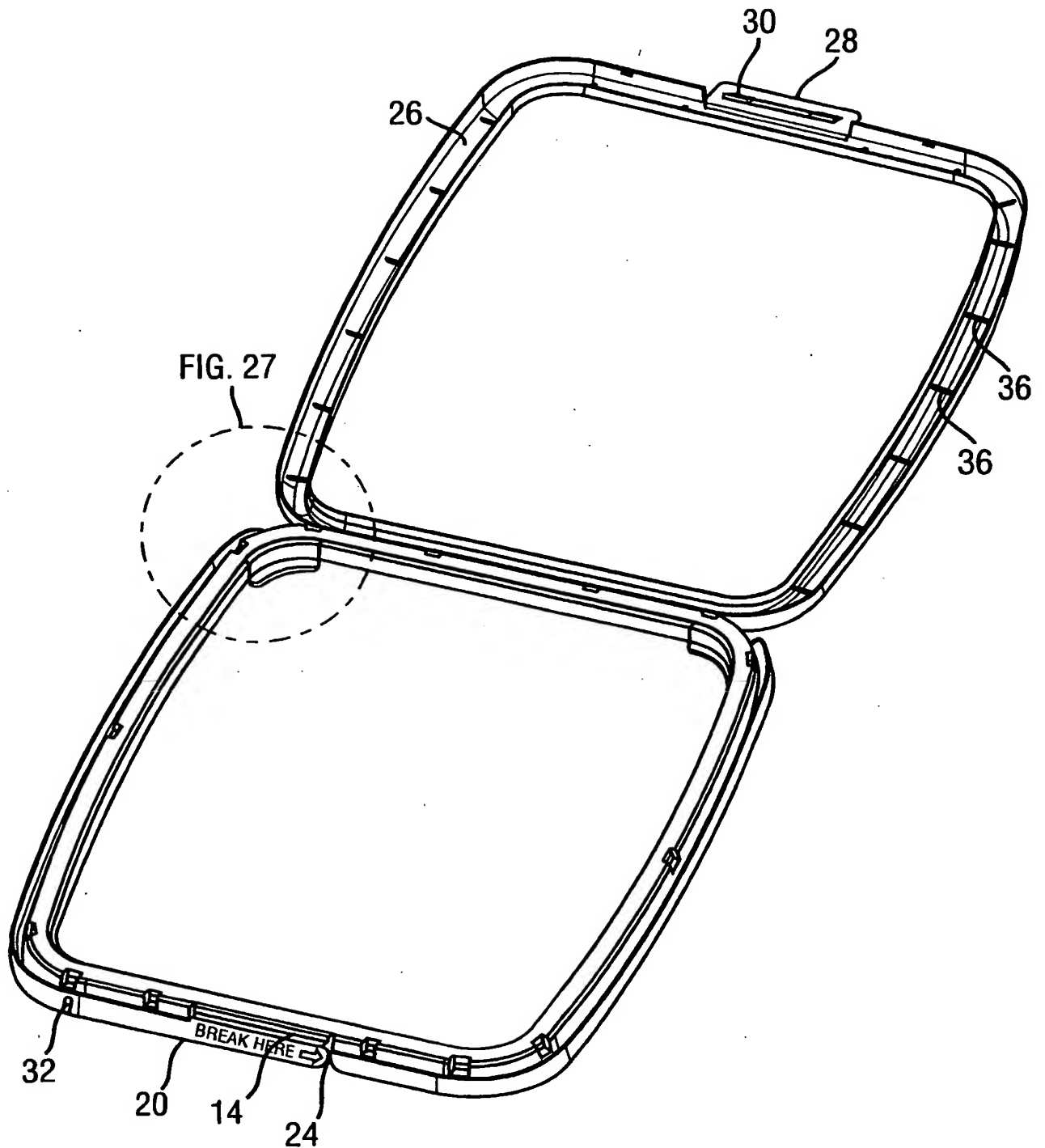


FIG. 25



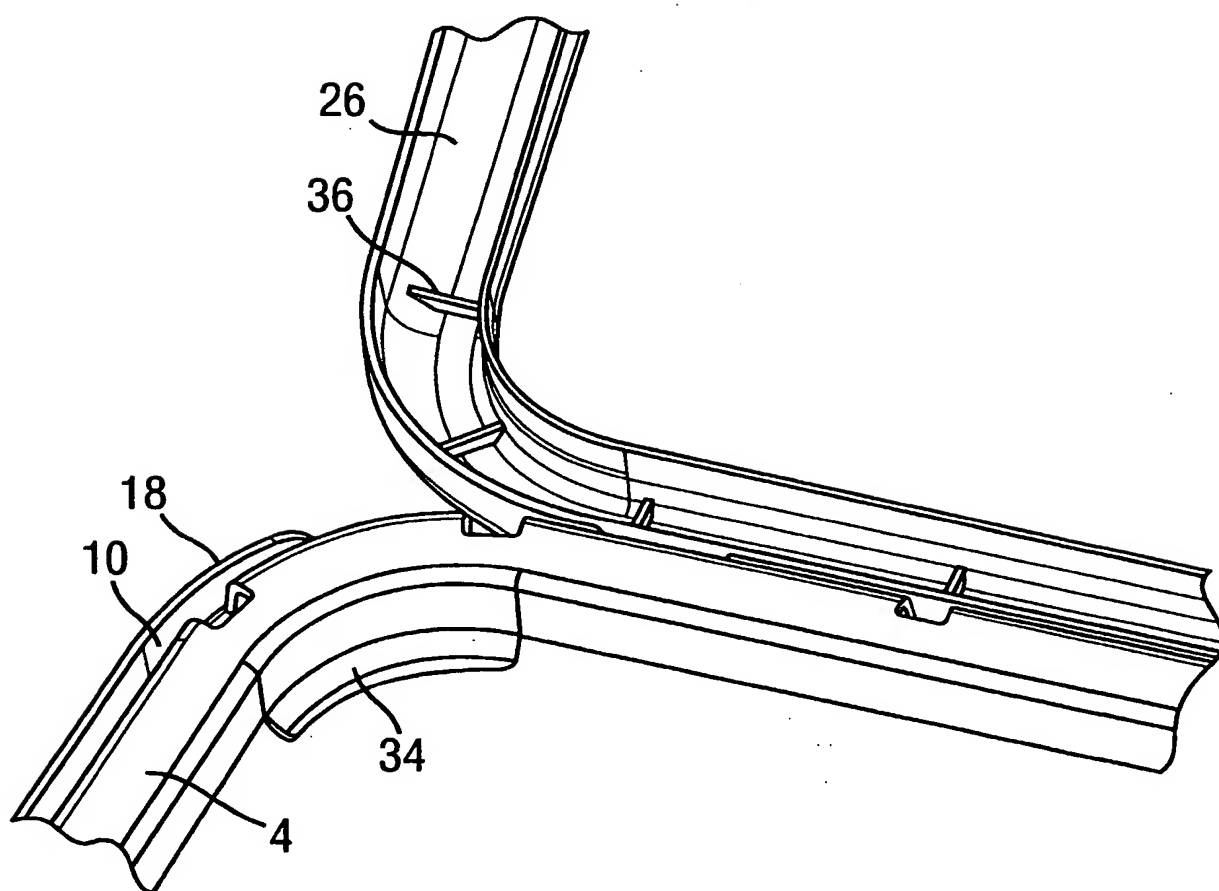
13/27

FIG. 26



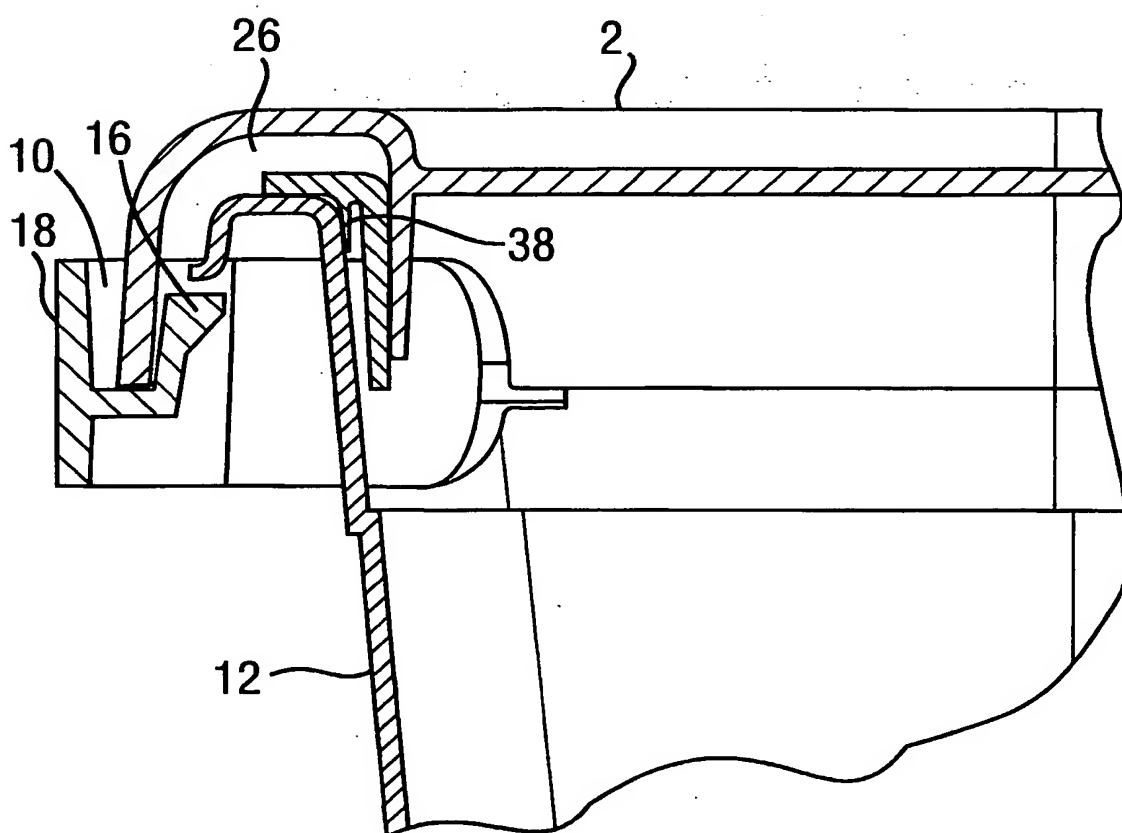
14/27

FIG. 27



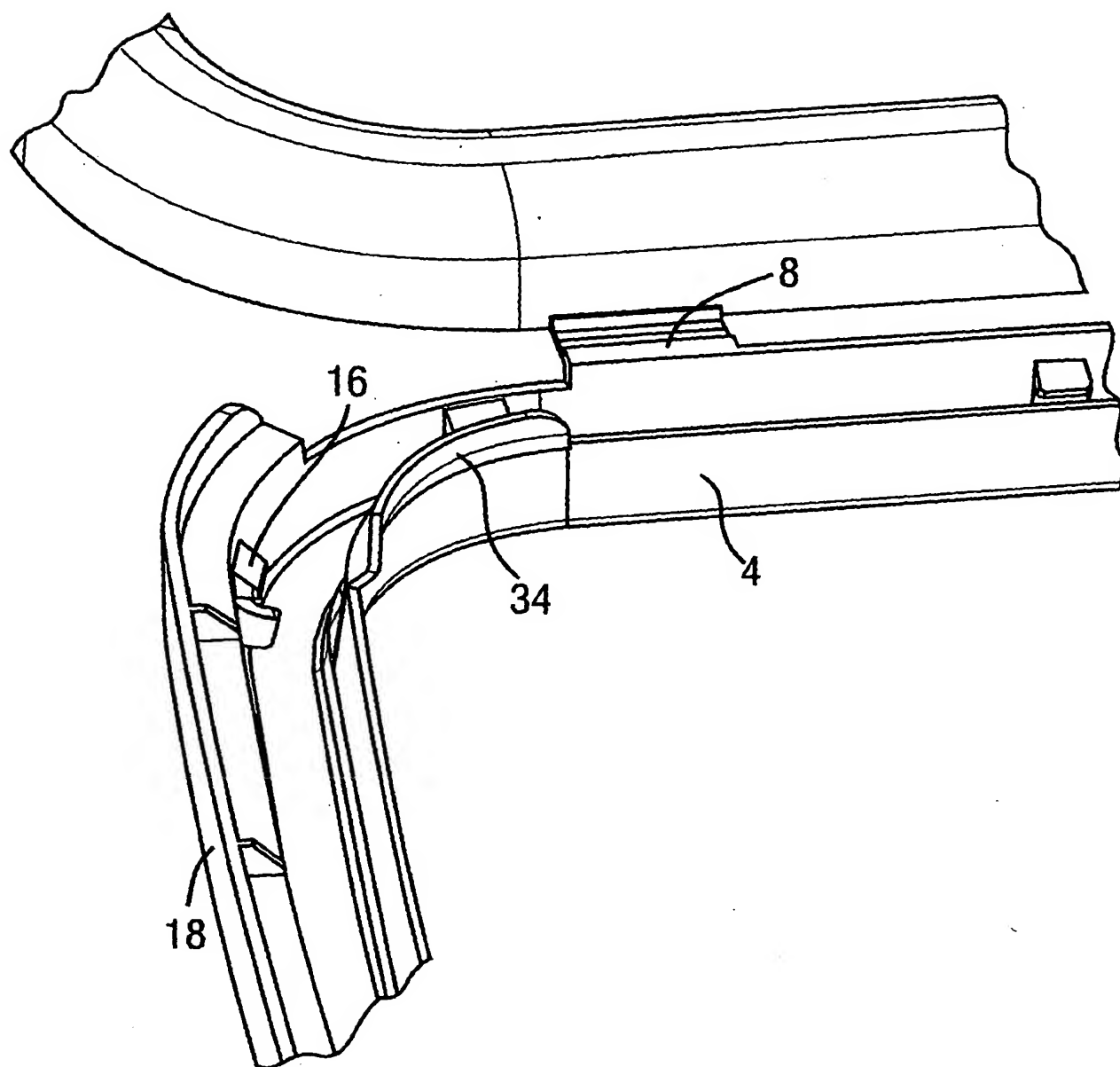
15/27

FIG. 28



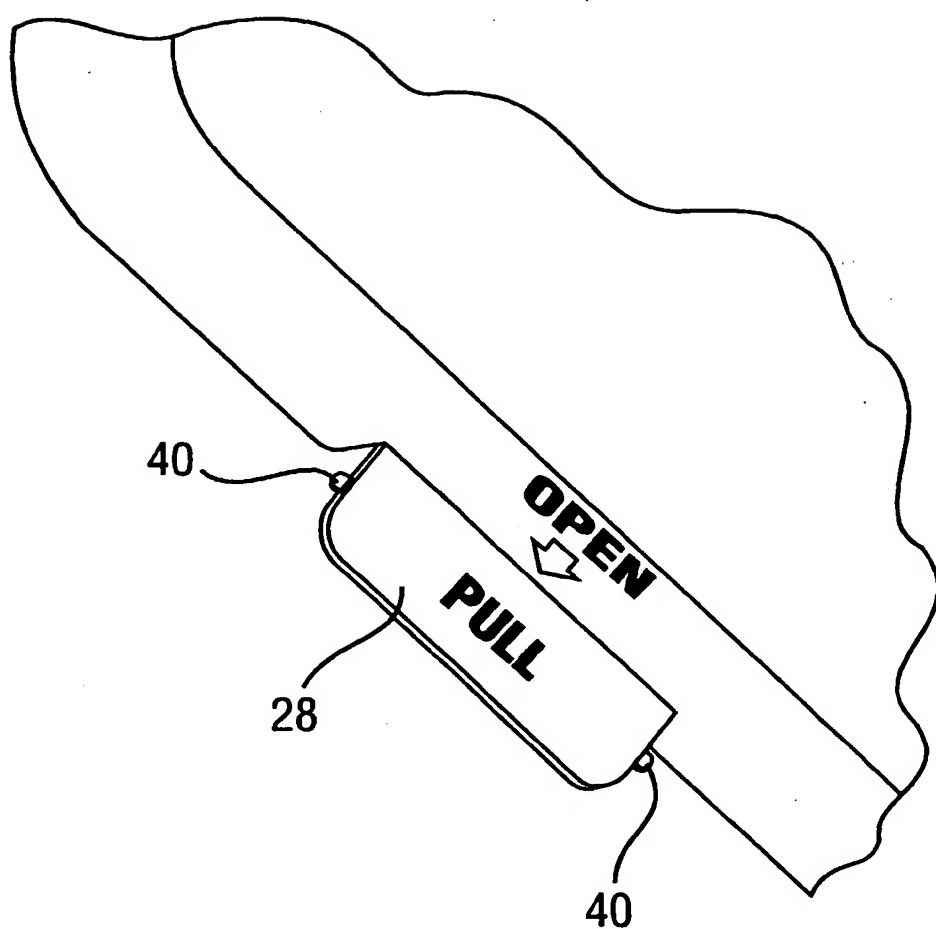
16/27

FIG. 29



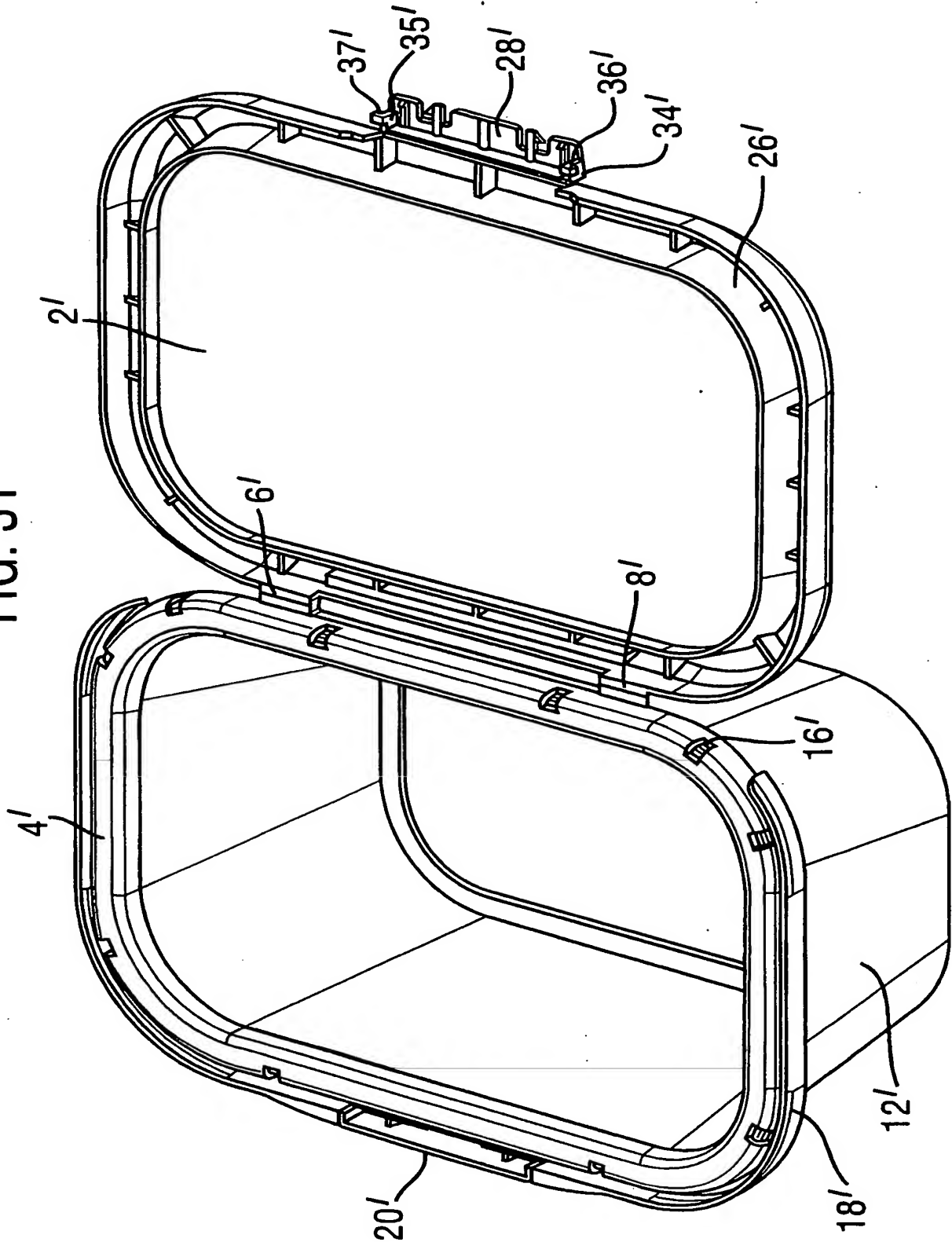
17/27

FIG. 30



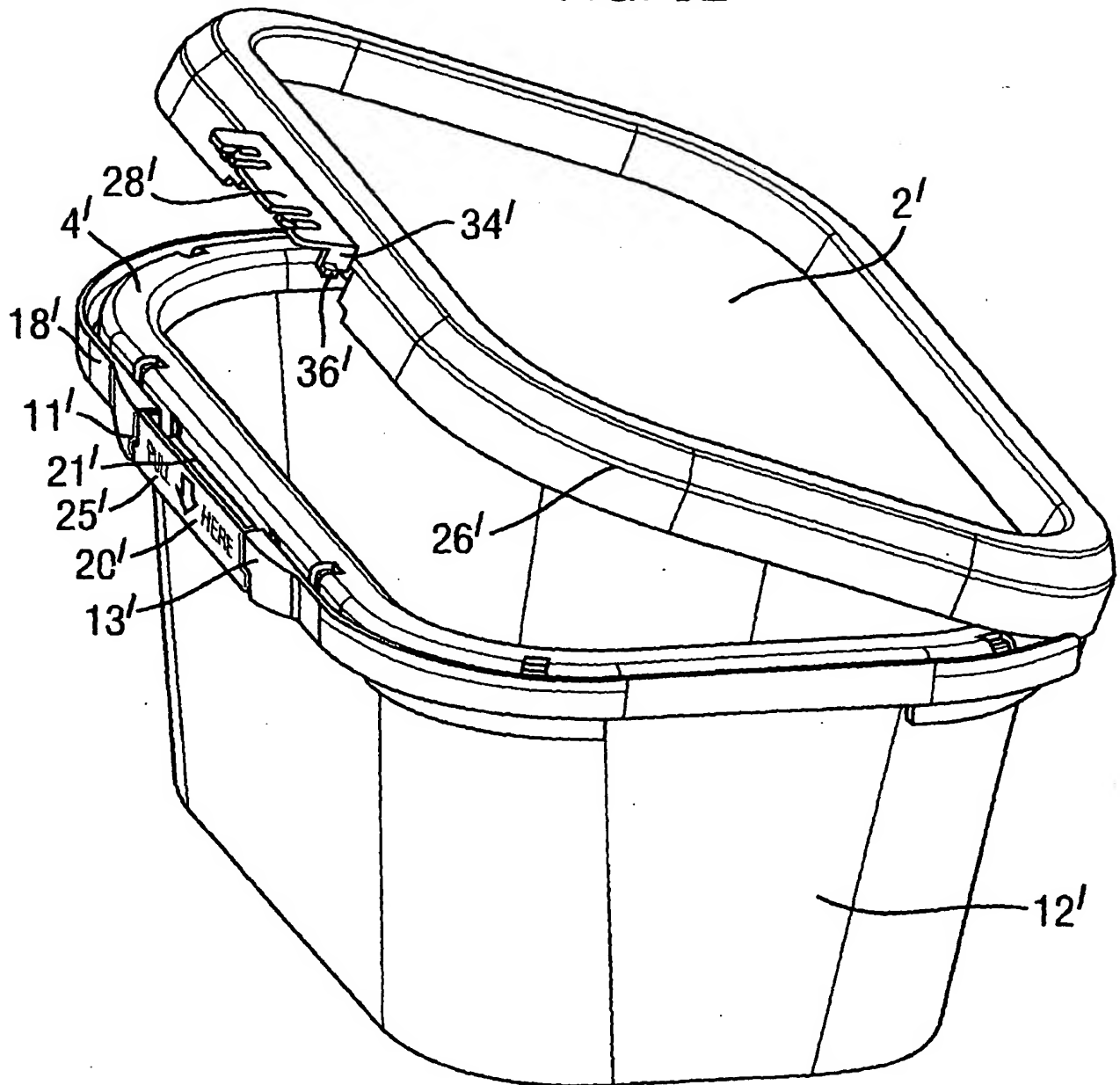
18/27

FIG. 31



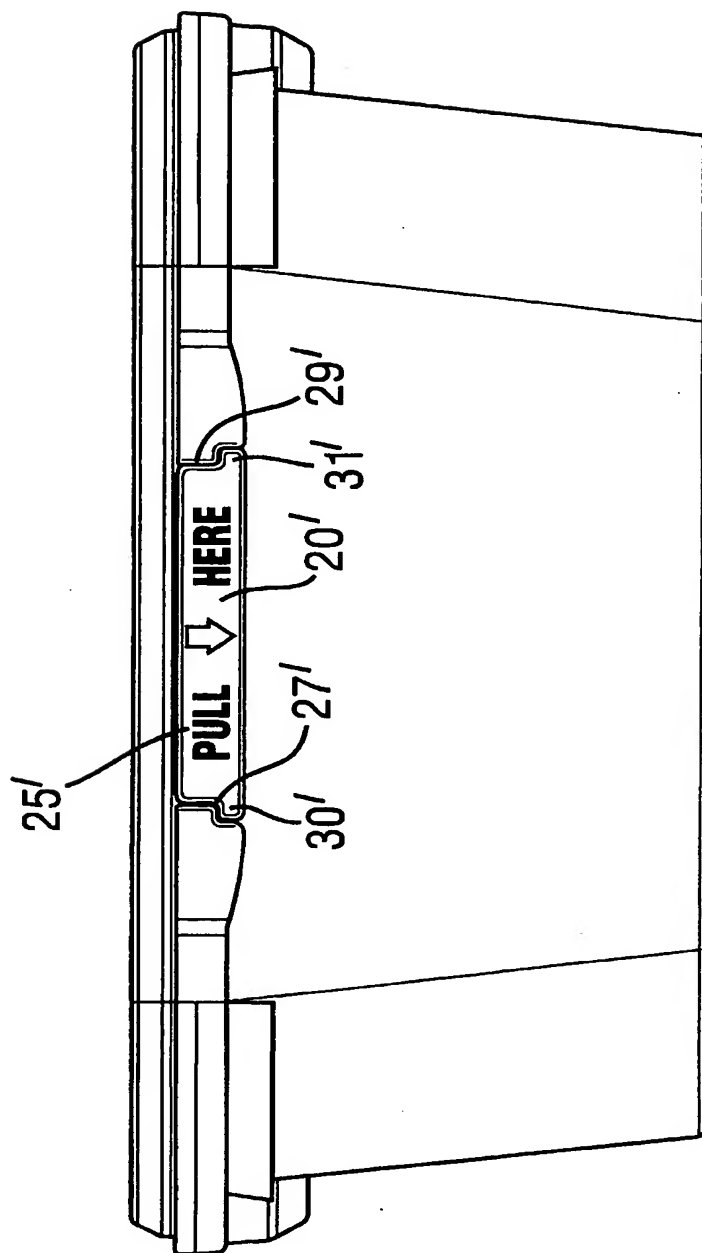
19/27

FIG. 32



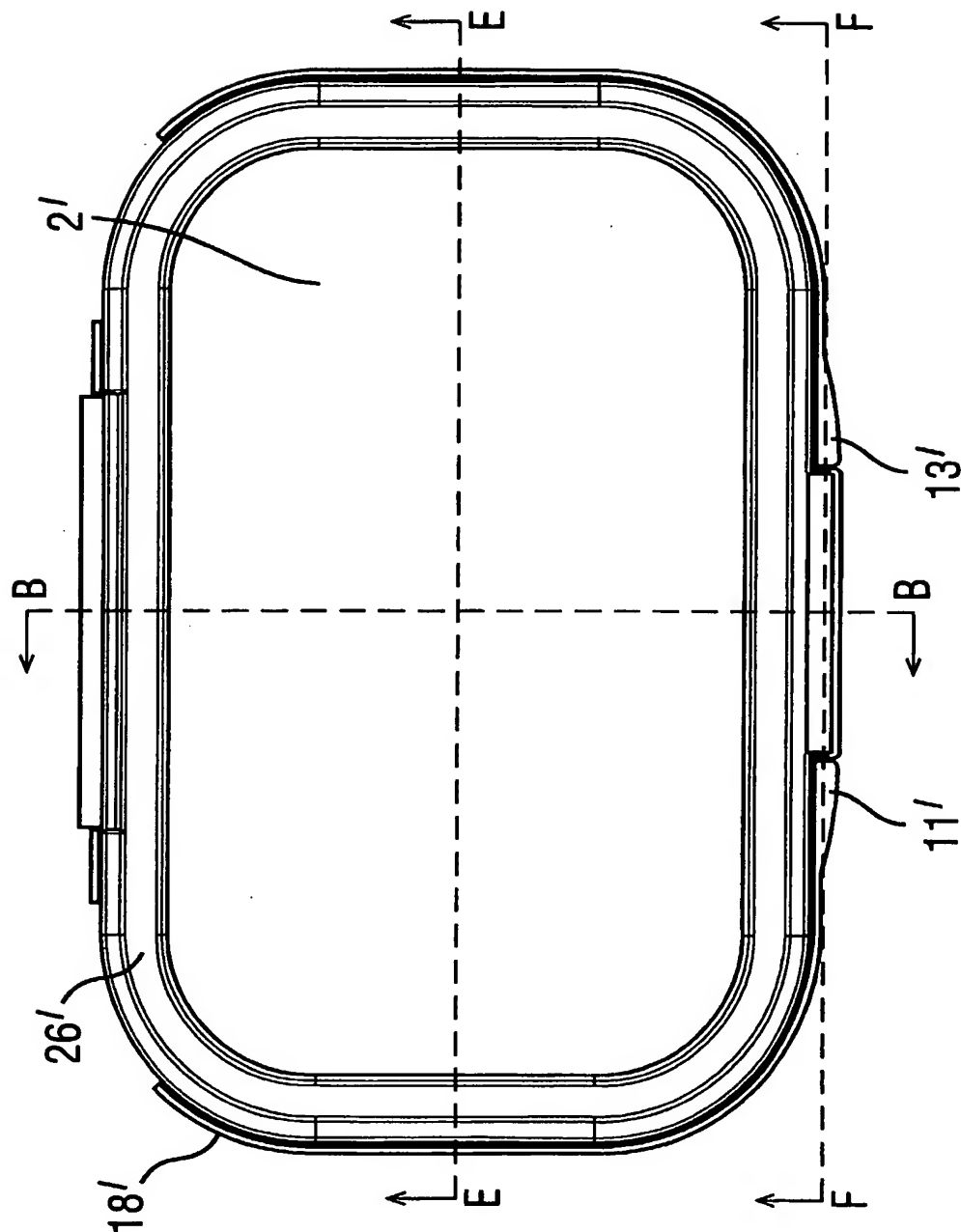
20/27

FIG. 33



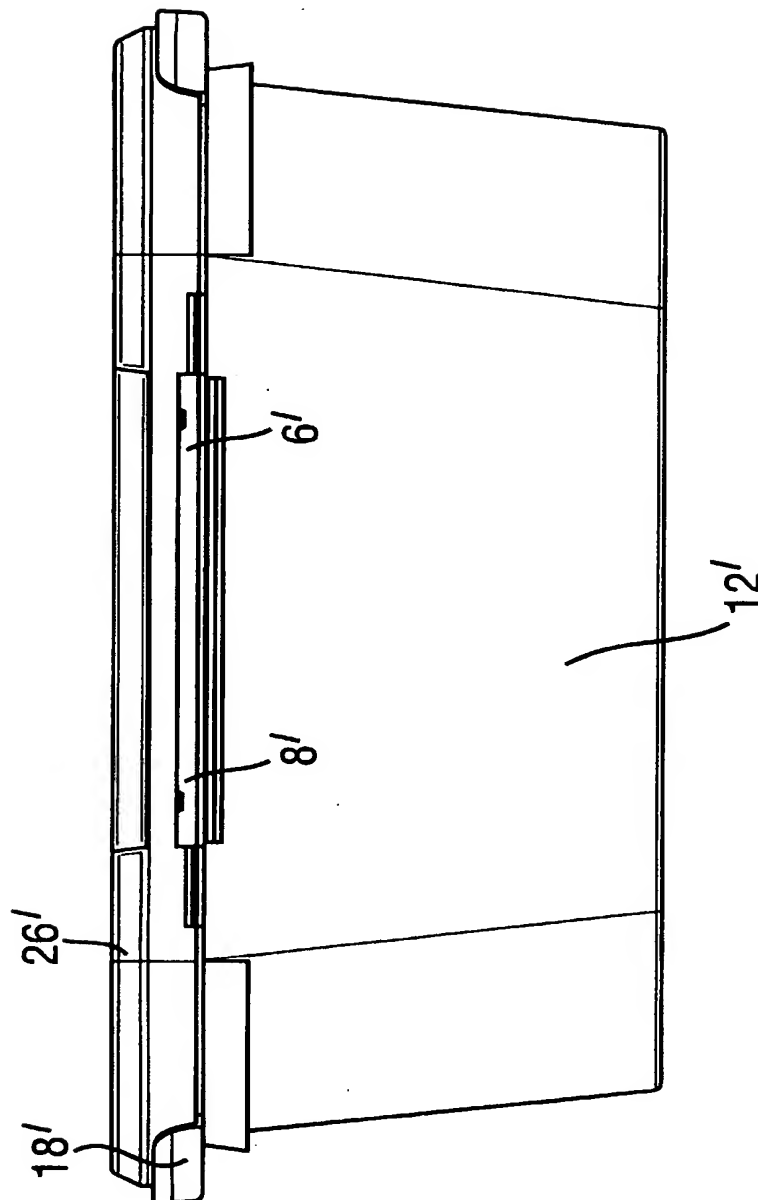
21/27

FIG. 34



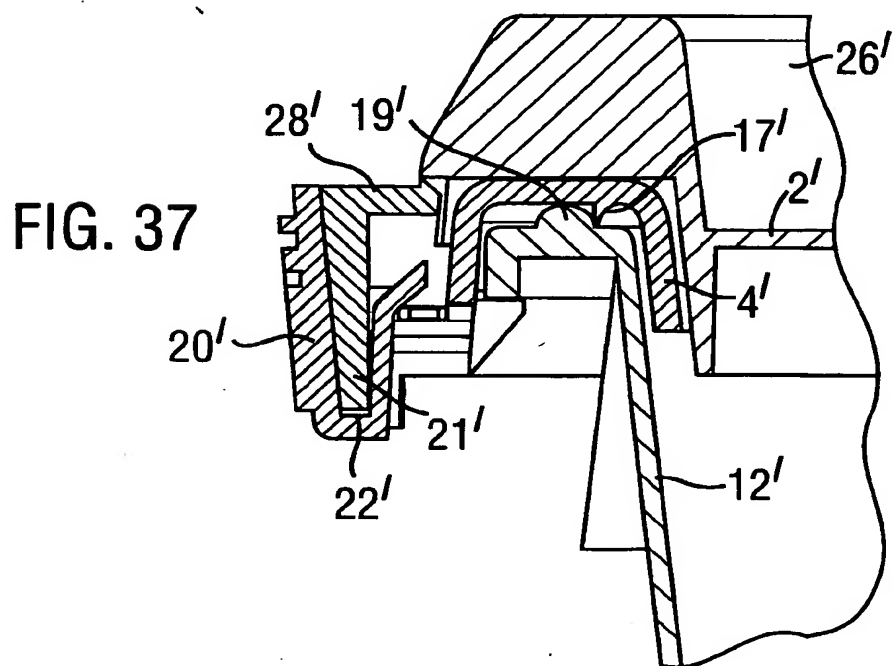
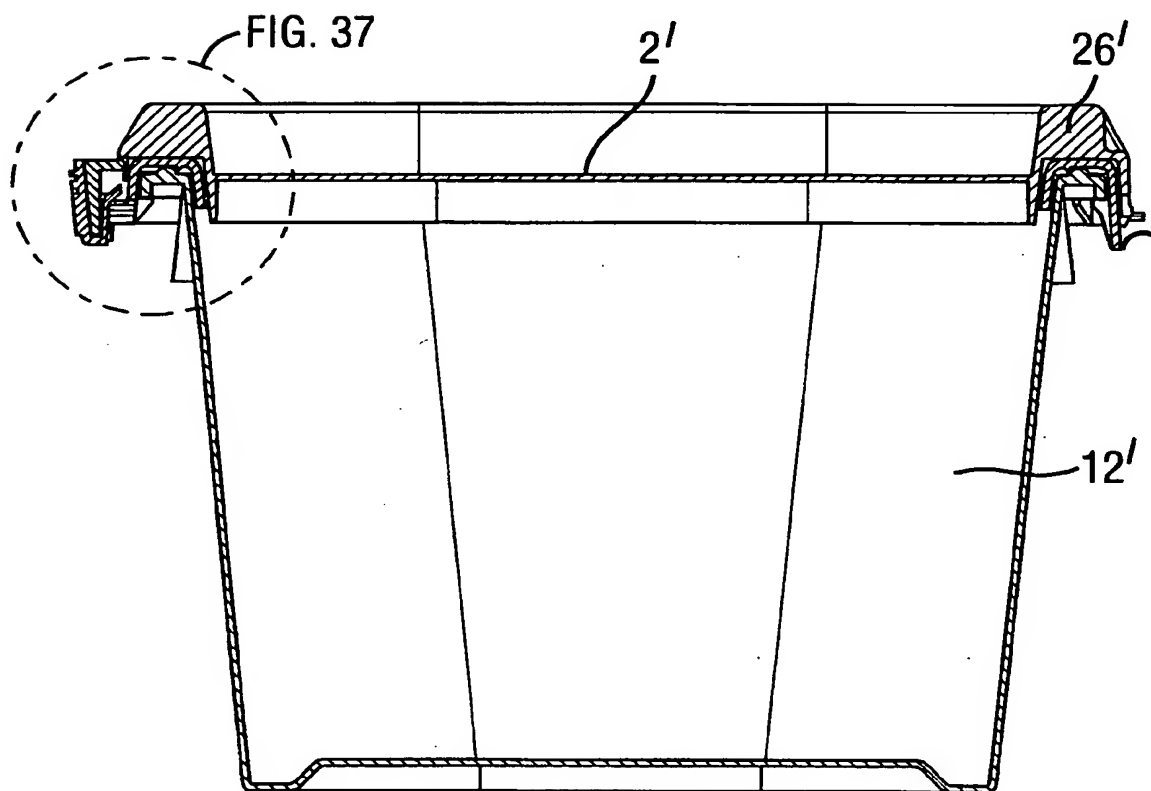
22/27

FIG. 35



23/27

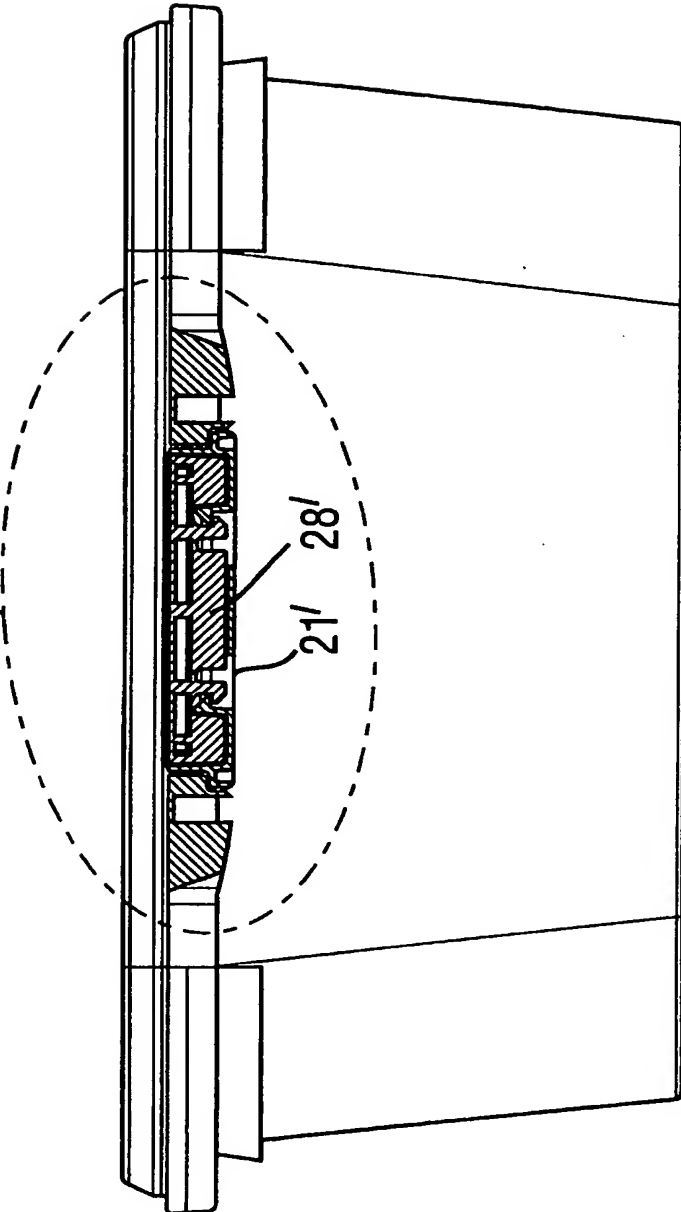
FIG. 36



24/27

FIG. 38

FIG. 39



25/27

FIG. 39

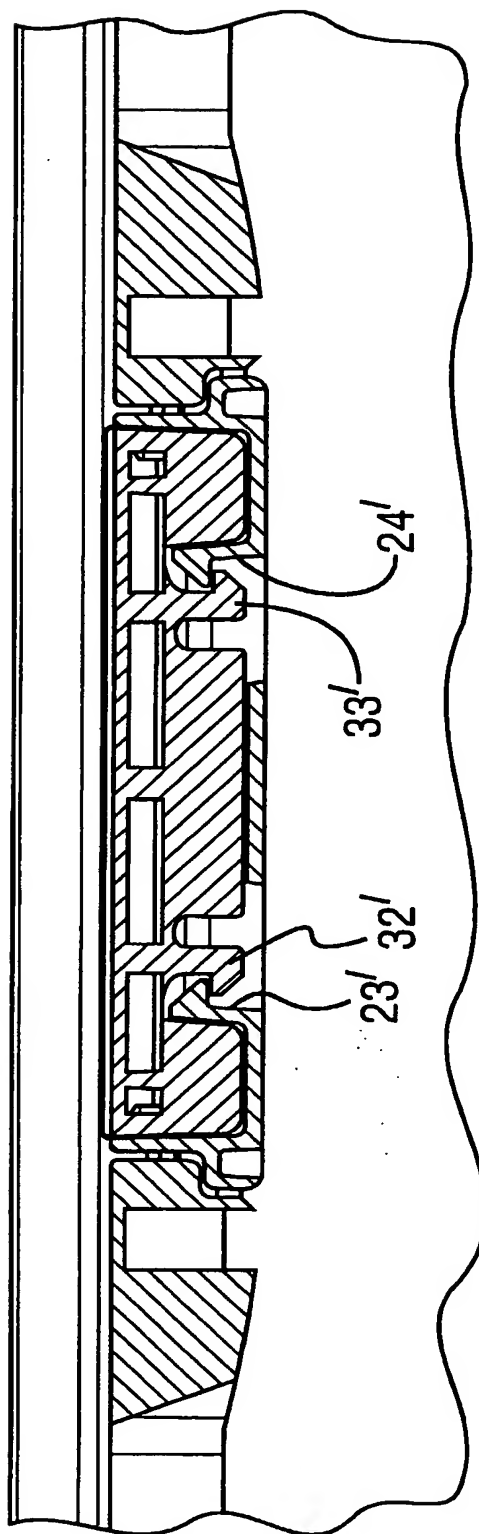
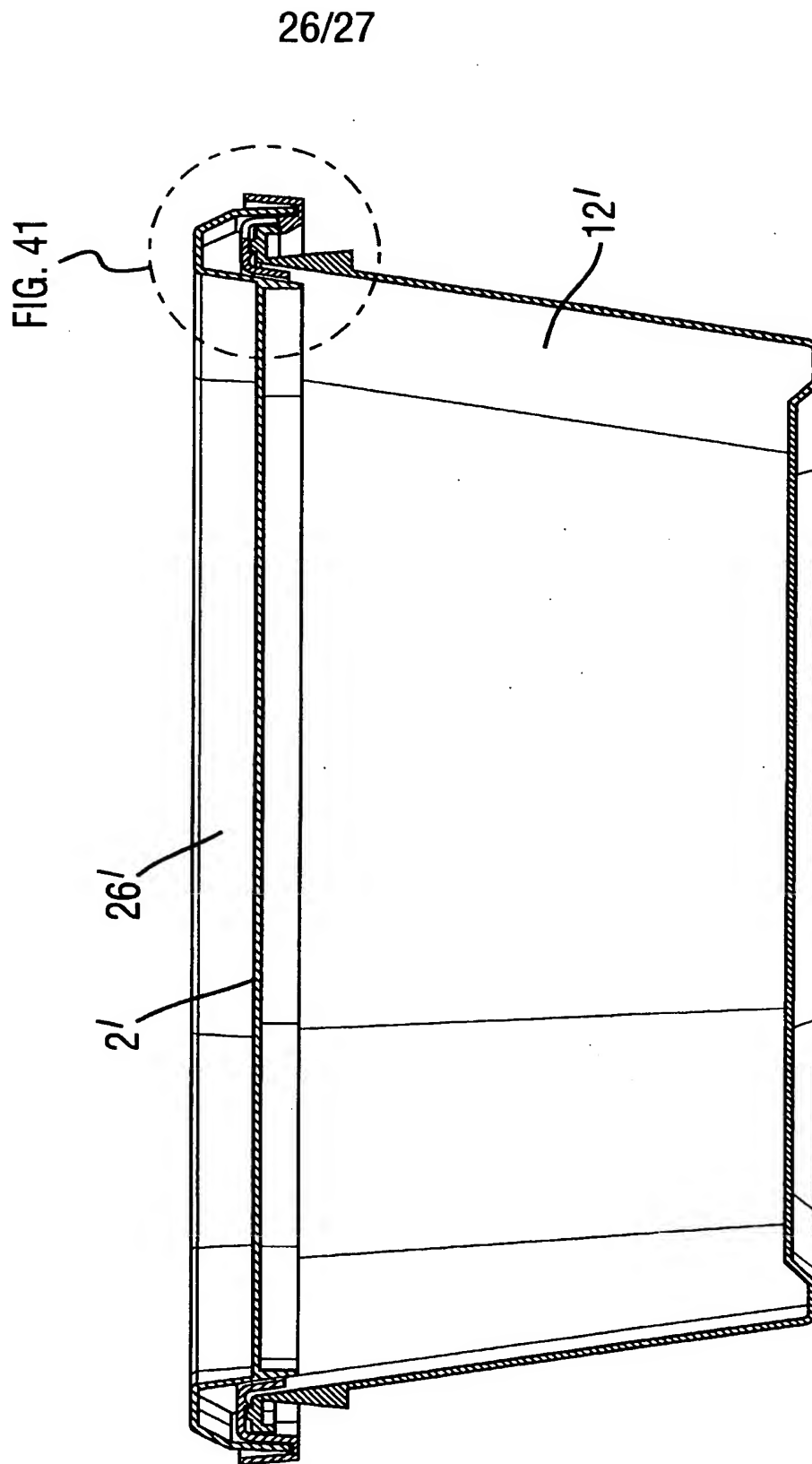


FIG. 40



27/27

FIG.41

